STEEL

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THE DAY OF PIG IRON DAWNS

PERSISTENT quest for better ways to make iron led artisans of the Middle Ages through succeeding steps in the evolution of their industry. Bloomaries grew higher and larger, but still produced only wrought or bar iron ▾ ▾ ▾ In the fifteenth century German and Belgian iron masters conceived the plan of closed furnaces, with strong artificial blast which reduced the ores to molten metal that could be run off into shapes for remelting ▾ ▾ ▾ At the beginning of the sixteenth century the blast furnace was introduced into England, cradle of the iron and steel industry, and its real development began ▾ ▾ ▾ Furnaces sprang up, water power drove the bellows for blasts and the production of charcoal for furnace fuel became at once an industry and a threat to the timber supply of Britain ▾ ▾ ▾ Midway in the eighteenth century, charcoal scarcity had begun to throttle the industry, and while Britain was producing 18,000 tons of pig iron per year she was importing 20,000 more from Germany and encouraging iron production in the American colonies.

Interlake Iron Corporation has six modern blast furnaces in which every resource of modern metallurgy is utilized to give greater service to the user of pig iron. Plant locations are convenient to the most important industrial area of the country and careful attention is given the requirements of its smallest or largest consumer.

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Volume 90 Number 11

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

The Week In Steel

IN MUCH the same manner that perfection is the sum of trifles, the recovery of industry will be the product of numerous unrelated acts of reconstruction. In steel, the past week, the forces of reconstruction made important accessions. The new federal tax bill is singularly free of complications for steel producers. Election of a new president of the United States Steel Corp. is a settling factor for that organization. February has turned in a modest gain in steel as well as pig iron production, and the parallel with 1921 suggests a slow but unbroken rise until midsummer. Market sentiment continues buoyant, Ford tonnage buying is expected within the week, and while price cutting has not entirely vanished there are more recruits for stabilization.

March 9 Begins New Ford Era

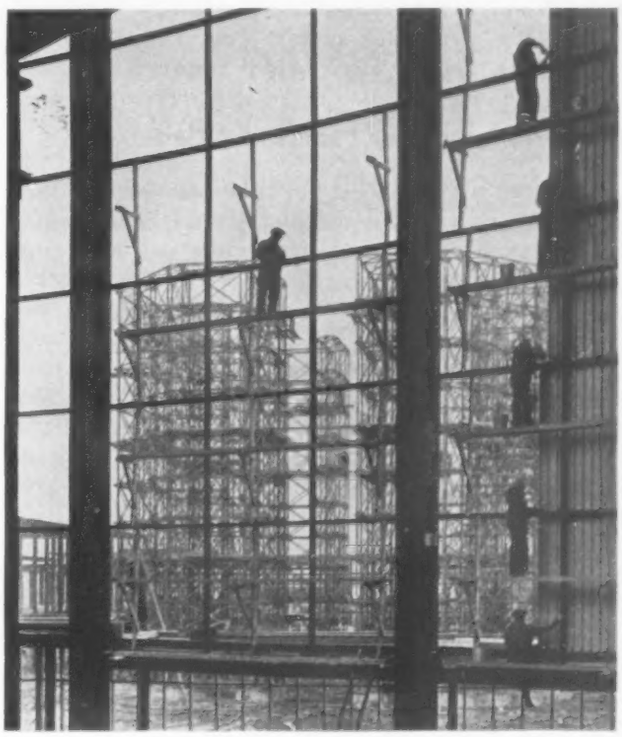
Henry Ford March 9 stamped No. 1 on the first V-eight motor assembled in what might be termed regular production. In small pickup lots and releases, sufficient parts and materials for a small run of both the new four and eight for show purposes have been accumulated; tonnage buying apparently cannot be much longer deferred (page 25). Nearby Ford activity may be gaged by this historical comparison: No. 1 Model A left the line Dec. 2, 1927; the daily rate crossed 300 on Dec. 30 and 1000 on Feb. 14, 1928; it required 5 months to assemble the first 100,000—the number now estimated to stock Ford dealers. On this basis, dealer requirements alone will support rising Ford production until August.

Manufacturing Trade Supporting Steel

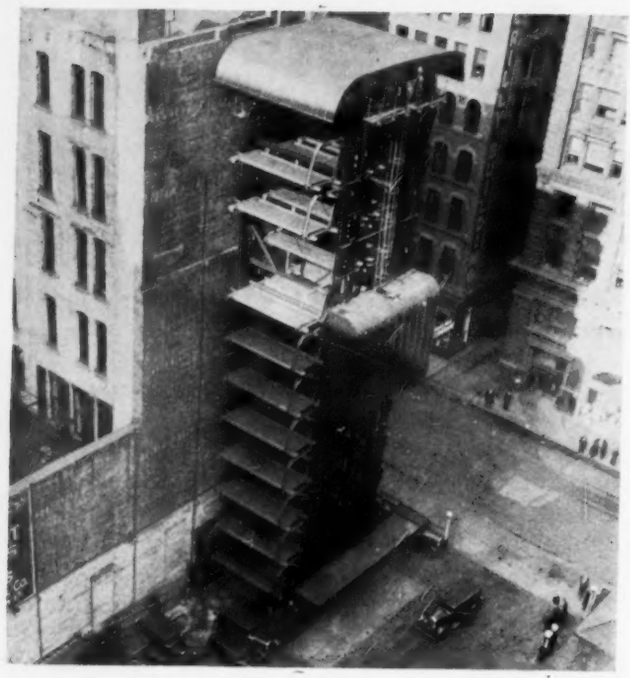
Anticipating Ford releases, some manufacturers of materials and parts have been building up small banks for immediate shipment, but it is a steady if attenuated flow of demand from the general manufacturing trade that is maintaining steel production at 25-26 per cent (page 47). . . . Some encouragement is derived from the fact steel ingot production in February (page 24) registered the second consecutive monthly increase. . . . The decline of 102,521 tons in unfilled orders of the Steel corporation as of Feb. 29 (page 20) is ascribed entirely to the lack of railroad business. . . .

New Corp. Head a Popular Choice

To the chair occupied successively by Charles M. Schwab, William E. Corey and James A. Farrell at 71 Broadway comes William A. Irvin. This new president of the Steel corporation (page 15) is described as boldly independent,



Steel trees! Framework in background will be stuccoed, decorated in green, gold and black, to simulate trees for 1933 Century of Progress Exposition at Chicago. Workmen in foreground are attaching steel siding to electrical building



Steel cradles supported by endless chains permit vertical parking of 48 autos in the ground space of 6. This Westinghouse Electric & Mfg. Co. device is operating in Chicago

utterly frank, unassuming, kindly. . . . As he comes to share with Myron C. Taylor the direction of the largest American steel producer its affairs can scarcely turn any other way than up. A stern rear-guard action is what the corporation's pamphlet report for 1931 reveals (page 15), record lows being general.

Last Manufacturer Holds the Bag

Only an altruist can appraise as constructive a tax bill calculated to raise over a billion dollars annually, yet steel can view the new proposed sales and excise taxes with comparative equanimity (page 17). Because the 2¼ per cent sales tax is to be levied upon the final manufacturing process, and steel products usually are raw material for further fabrication, steel producers apparently will provide little nourishment for the federal treasury. There is opposition to the bill, but the chances of early passage are good. . . . Washington is not always constructive, however. Charging the steel industry with gross over-capitalization (page 16), Minnesota's farmer-labor senator claims a proper adjustment would permit a reduction in the rail price from $43 to $20.

Put Gilt Edge on Rusty Scrap

Iron and steel scrap was clothed with the dignity of a bank investment when members of the Scrap institute, conferring with President Hoover, suggested their product as sound collateral because of its low price (page 21). Banks refusing to extend reasonable credit to the scrap trade may feel the sting of a White House reprimand. . . . New York banks are making an investment that will not be scrap for generations (page 20) in the reinforced steel vaults they are installing, some with doors 30 inches thick. . . . Scrap dealers, well organized, are in rapport with the effort of structural fabricators to liberalize antitrust law enforcement (page 21), contending the intent of these laws is not to prohibit co-operation but to preserve competition.

Still No Virtue Like Thrift

Depressions may come and panaceas go, but there is no substitute for thrift, nurtured by employers, to fortify workers against idleness. So the National Industrial Conference board deduces (page 18) after analyzing relief measures adopted by industry. . . . Shortening the work week, the Conference board ascertains (page 20), distributes employment temporarily among more workmen but in the long run increases unit manufacturing costs and compels further mechanization. . . . Despite the wage reduction effective Oct. 1, Steel corporation employes averaged $5.90 per day in 1931, only 9 cents or 1.5 per cent below 1930 (page 14). Last year 84 per cent of the full normal working force was maintained, 53,619 workers being on full time and 150,055 part time.

Gentle to Tools, but Fights Corrosion

A new corrosion-resistant steel, analyzing 16 per cent chromium and 1 per cent each copper and silicon has been developed to meet the demand for a stainless steel which can be mill processed and handled by the fabricator with the same tools, furnaces and heat-treatment as for mild steel (page 34). This material is magnetic and does not work-harden like other similar alloys. . . . Not often does corrosion-resistant steel go so high as the tip of the new Cities Service building (page 19), now dominating the skyline of Lower Manhattan.

Making the Most of Steel

To spread the gospel of taking the greatest possible advantage of the inherent properties of steel is the mission of "Making the Most of Steel" (page 35), companion department to "Progress in Steelmaking" (page 40). For example: Unique methods of working stainless steel, how crystal japans in various colors are applied to metal parts, lead-coating of steel parts by the fusion process, centrifugal casting of gray iron brake linings (also page 31), studies of embrittlement of galvanized structural steel.

Irvin Is New Head of Steel Corp.; Plan Decentralization?

NEW YORK — An operating man, risen from the ranks of the Corporation, succeeds to the presidency of the United States Steel Corp. on April 19 when James A. Farrell steps out.

Courageous, independent, frank, impatient with red tape, unassuming, kindly—is the way William A. Irvin, whose selection was announced March 9, is described by his associates.

For Mr. Irvin to be pegged for 20 years in one post, that of assistant to the operating vice president of the American Sheet & Tin Plate Co., a Corporation subsidiary, and still be prepared for his "big chance" after passing age 50, is reminiscent of the career of the late Judge E. H. Gary, chairman of the Corporation until his death in 1927. For 30 years Judge Gary commuted between Chicago and a suburb, being 52 years old when becoming associated with J. Pierpont Morgan in the formation of the Corporation.

In Steel Industry 37 Years

Since 1895 Mr. Irvin has been identified with the steel industry, his connection with the American Sheet Steel Co., forerunner of the Sheet & Tin Plate company, dating from 1900. From 1904 to 1924 he was attached to the operating department, as before mentioned. After seven years as vice president, he was called to New York in September, 1931, to become a vice president of the Corporation. Last Dec. 7 he was 58 years old.

Mr. Irvin has the reputation of accomplishing objectives by demanding much of his subordinates but even more of himself, and of being forceful and persistent in a kindly manner. The receipt of a great many letters of congratulation from former close associates addressed to "Bill" attests to the popularity of the directors' choice.

Hint Two Major Changes

Rounding out the trinity that will direct the Corporation through the reconstruction period, with Myron C. Taylor, chairman of the finance committee, and W. J. Filbert, for many years comptroller and now vice chairman of this committee, Mr. Irvin will supply the operating, production and sales guidance.

Only occasional, unofficial hints have fallen, but it is believed further important changes are in store for the Corporation, growing out of the intimate study made by Mr. Taylor since his accession to the finance committee following Judge Gary's death.

Part of this program, apparently, is the closing of obsolete mills and the concentration of production in the more modern low-cost properties. Still another departure, which is known to be under consideration but which thus far has not been publicly discussed, pertains to a centralization of the various subsidiaries.

This program, for example, would involve the amalgamation of all Corporation subsidiaries at Chicago, Pittsburgh and Birmingham into one company in each district. Each company thus organized would be more autonomous than the various subsidiaries now are.

William A. Irvin

At one stroke there would be decentralization, in that each district would be practically self-contained, and yet there would be an efficient and economical centralization of production and selling effort. It is known that such a program has been discussed, but there has been no official statement concerning its consummation.

When Mr. Irvin is inducted April 19 he will be only the fourth president the Corporation has had since its formation in 1901. His predecessors are Charles M. Schwab, William E. Corey and the present incumbent, Mr. Farrell.

Mr. Irvin is the second former Sheet & Tin Plate executive to rise to prominence in the Corporation's New York headquarters. H. L. Austin, who became comptroller succeeding Mr. Filbert late in January, was auditor of the Sheet & Tin Plate company before coming to New York in 1914.

Steel Corp. Sets New Lows in 1931

UNITED STATES STEEL CORP. operations in 1931 averaged 38 per cent of capacity, compared with 65.6 per cent in 1930, according to the corporation's annual pamphlet report just issued. From a high of 50 per cent in the first quarter the rate dropped steadily month to month, to a low of 24 per cent in December.

The year's average was the lowest ratio of operations to capacity in the corporation's history, breaking through the previous low of 47.5 per cent of 1921.

Costs increased steadily, the report points out, as operations and prices declined, prices received for finished steel averaging about 8 per cent less than in 1930 for domestic, and 4 per cent less for export, sales. Drastic economies were put in effect, including wage and salary reductions, but though the savings ran into large totals they were insufficient to offset the increased costs due to reduction in the corporation's business.

Production Curtailed

Production of rolled steel for sale dropped from 11,609,264 net tons in 1930 to 7,196,017 tons in 1931; output of open-hearth and bessemer steel ingots was reduced from 16,726,472 gross tons to 10,082,398 tons; of pig iron, ferroalloys and spiegeleisen from 12,758,333 tons to 7,021,507 tons; of coal, from 25,388,265 tons to 15,779,298 tons; coke, from 13,113,382 tons to 7,040,832 tons; iron, manganese and zinc ores, from 24,295,103 tons to 13,600,716 tons.

Compared with 1929, the production of rolled and finished steel products for sale in 1931 represented a decrease of 8,106,652 tons, or 53 per cent. Compared with 1930, the reduction was 4,413,248 tons, or 38 per cent.

As of Jan 1, 1932, the available rated annual capacity of subsidiary companies was as follows: Blast furnaces, 21,846,700 tons; steel ingots and castings, 27,841,300 tons; finished steel products for sale, 19,647,000 tons. At the beginning of 1931, the comparative figures were: Blast furnaces, 21,737,000 tons; steel ingots and castings, 26,075,000 tons;

finished steel for sale, 18,371,000 tons.

Domestic shipments of rolled and finished steel products in 1931 amounted to 7,162,359 tons, a reduction of 3,638,279 tons, or 33.7 per cent from 1930. Other domestic shipments, including ingots, pig iron, scrap and ferroalloy; coal, coke iron ore and limestone, and miscellaneous materials brought the total for 1931 to 9,631,716 tons, 39.3 per cent less than in 1930.

Exports of rolled and finished steel products, 514,385 tons, were 309,271 tons, or 37.5 per cent less, than in 1930; and the total of all export shipments, 616,381 tons representing a reduction of 36.4 per cent from 1930. The foregoing figures are exclusive of the corporation's production and shipments of portland cement.

The total value of domestic business, covering all of the shipments, and including cement and marine equipment, in 1931 was $452,665,506, or 35.6 per cent less than in 1930; and the total volume of export business $40,207,210, down 37.8 per cent.

The average price received for the total tonnage of rolled and other finished steel products netted on domestic shipments $4.60 less per ton in 1931 than in 1930; and on exports shipments, $2.84 less than in 1930.

Total value of the business transacted by all the corporation's subsidiaries in 1931, as represented by their combined gross sales and earnings amounted to $729,377,467, compared with $1,180,934,971 in the preceding year.

Net Earnings at New Low

The corporation's net earnings, $46,483,999, in 1931 were the lowest of any year in its history, the second lowest being in 1904, in which year they were $73,176,522. Net earnings for 1930 were $157,710,231.

Net capital expenditures during the year amounting to $30,125,353 compare with $175,030,528 in 1930, abnormally large due to plant purchases in that year. The expenditures last year, however, were the lowest since 1922.

Efforts by the corporation to reduce the effects of unemployment are reflected in the fact the number of its employes working part time last year was 150,055, while the number working full time was only 53,619. The total number employed was 203,674, or 84 per cent of the corportion's full normal working force, that is, the number required to operate all departments at practically full capacity.

Despite the salary reduction Aug. 15, and the wage reduction, Oct. 1, the average earnings per employe per day, including general administrative and selling forces, were $5.90, only 9 cents less than in 1931. The curtailment in payrolls arising from the wage and salary adjustments to the close of December amounted to $3,991,000.

The payroll for the full year was $266,871,413, a reduction of $124,399,953, or 31.79 per cent, from 1930.

Steel Corporation Statistics

Year	Gross receipts	Net earnings	Capital expenditures	Production steel ingots gross tons	Production finished steel for sale, net tons	Shipments finished products net tons	Number of employes
1931	$729,377,468	$46,483,999	$30,125,353	10,082,398	7,196,017	7,676,744	203,674
1930	1,180,934,971	157,710,231	175,030,528	16,726,472	11,609,265	11,624,294	211,055
1929	1,509,584,637	265,838,932	59,329,674	21,868,816	15,302,669	15,234,355	224,980
1928	1,374,443,432	200,986,299	51,570,108	20,105,749	13,972,388	13,973,129	221,702
1927	1,310,392,861	172,315,489	97,585,998	18,486,444	12,979,282	12,993,283	231,549
1926	1,508,076,090	207,345,153	76,060,520	20,306,668	14,334,412	14,279,929	253,199
1925	1,406,505,195	173,783,424	70,893,944	18,898,697	13,271,010	13,388,846	249,833
1924	1,263,711,468	161,183,467	79,619,986	16,478,857	11,722,908	11,526,890	246,753
1923	1,571,414,483	187,953,667	60,762,920	20,329,950	14,721,469	14,373,822	260,786
1922	1,092,697,772	109,788,916	23,551,991	16,082,385	11,785,331	11,911,904	214,931
1921	986,749,719	100,791,279	70,091,866	10,966,347	7,860,334	7,958,833	191,700
1920	1,755,477,025	185,095,359	102,956,133	19,277,960	14,228,502	14,098,707	267,345
1919	1,448,557,834	152,290,639	87,091,514	17,200,373	11,997,935	12,243,183	252,106
1918	1,744,312,168	208,281,104	129,855,037	19,583,493	13,849,493	14,124,986	268,710
1917	1,683,962,552	304,161,471	117,977,117	20,285,061	14,942,911	15,370,105	268,058
1916	1,231,473,779	333,574,177	64,680,648	20,910,589	15,460,792	15,542,088	252,668
1915	726,683,589	130,396,011	15,537,431	16,376,492	11,762,639	10,982,748	191,126
1914	558,414,933	71,663,615	28,171,013	11,826,476	9,014,512	9,078,559	179,353
1913	796,894,299	137,121,844	41,999,098	16,656,361	12,374,838	12,168,758	228,906
1912	745,505,515	108,174,673	13,780,361	16,901,223	12,506,619	12,696,935	221,025
1911	615,148,839	104,305,466	49,430,851	12,753,370	9,476,248	9,460,169	196,888
1910	703,961,424	101,054,754	53,101,221	14,179,369	10,733,995	10,727,751	218,435
1909	646,382,251	131,491,414	37,916,250	13,355,189	9,859,660	9,691,290	195,500
1908	482,367,840	91,847,710	49,422,697	7,838,713	6,206,832	7,102,456	165,211
1907	757,014,767	160,964,078	66,981,252	13,099,548	10,376,742	10,451,488	210,180
1906	696,756,926	156,624,273	32,155,146	13,511,149	10,578,433	10,862,425	202,457
1905	535,331,736	110,787,653	24,395,408	11,995,239	9,226,386	.....	180,158
1904	444,405,436	73,176,522	17,957,946	8,406,378	6,792,780	.....	147,343
1903	536,572,871	100,171,152	31,042,135	9,167,960	7,635,690	.....	167,709
1902	560,510,479	133,303,763	16,586,531	9,743,918	8,197,232	.....	168,127
1901	.....	84,779,293	.....	8,854,820	.....	.....	.....

*After federal taxes.

Bethlehem Ingots Up, Pig Iron Down

BETHLEHEM STEEL CORP., Bethlehem, Pa., in its pamphlet report for 1931 states that during the year it had increased its ingot capacity by 930,000 tons annually to 9,540,000 tons. At the same time, through the abandonment of four obsolete furnaces, pig iron capacity was cut to 6,375,000 tons yearly.

Ingot increase was due to open hearth additions at the Buffalo works, Lackawanna, N. Y., and at the Maryland plant, Sparrows Point, Md.

The Bethlehem plants worked at an average of 38.6 per cent of capacity in 1931, as compared with 61.7 per cent in 1930. The 1931 rate was almost one-third that of the 1929 average precentage of 91.8.

The company's pamphlet informs stockholders that under the Bethlehem bonus system, $397,364 was disbursed, but all in the first half of 1931. During 1931, $699,503 was paid in pensions to retired employes, compared with $591,746 in the previous year. Sick or disabled employes received $1,079,472 in 1931, under the company's relief plan out of contributions by participating employes.

"During 1931 we purchased the properties and assets of Levering & Garrigues Co., Hay Foundry & Iron Works and Hedden Iron Construction Co., which owned structural steel fabricating plants in or near Newark, N. J.," states the report. The Kalman Steel Co. also was acquired, and last June $16,000,000 of Bethlehem's 5 per cent consolidated mortgage 50-year sinking fund bonds were pledged in substitution for other collateral securing the McClintic-Marshall Corp. purchase of early 1931.

"The cash expenditures for additions and improvements to properties during 1931 amounted to $12,699,897. Estimated cost of completing the construction authorized as of Dec. 31, 1931, is $6,905,000. Expenditures on this program are now being made only on items needed under present operating conditions."

Adopts Stagger System

Granite City Steel Co., Granite City, Ill., has adopted the stagger system to distribute work among its 2500 employes.

A Dentist Talks on Rails

Washington — Discussing various financial problems over a nationwide

radio hookup March 7, Senator Henrik Shipstead, farmer-laborite of Minnesota and formerly a dentist, declared the steel industry is greatly over-capitalized and that if a proper adjustment were made steel products could be greatly reduced to the consumer. Steel rails now costing the railroads $43 a ton should actually be $20, he maintained.

Will Meet on Thursdays

New York—A shift of general meetings of the American Iron and Steel institute from Friday to Thursday is indicated by announcement that the next meeting will be held Thursday, May 19, at the Hotel Commodore, New York.

Headquarters of the institute were moved last week from 75 West street to 1829 Empire state building, 350 Fifth avenue.

Inspect New Sheet Mill

Birmingham, Ala.—High officials of the United States Steel Corp. recently inspected the new sheet mill of the Tennessee Coal, Iron & Railroad Co. here. The mill is about completed.

Northwest Operators Meet

Northwest Mining association, embracing mine operators in Washington, Oregon, Idaho and British Columbia, will meet in Tacoma, Wash., March 29-30.

Steel Products To Escape Sales Tax, Consumers Paying

WASHINGTON—Application of the proposed sales tax to the iron and steel industry promises to be comparatively simple through the device of licensing manufacturers and importers.

Intent of this tax, incorporated in what is known as the revenue bill of 1932, introduced in the house of representatives March 7, is to collect 2¼ per cent of the value of all manufactured products, with certain exceptions such as basic food products, farm produce, periodicals, books and religious articles—none of the exceptions being pertinent to the manufacture of iron and steel.

Licenses Cost $2

To prevent pyramiding of the tax, it is to be imposed upon the final manufactured product, and for this purpose all manufacturers and importers doing an annual business in excess of $20,000, excepting those in the exempted lines, will be issued a license costing $2 annually.

So long as an article is sold to another licensed manufacturer no tax will be collected. In other words, the last licensed manufacturer in any given sequence of production pays the tax.

For the iron and steel industry, the following apparently would be the procedure. A mill rolling plates would pay no tax upon the sale of its product to a fabricator of tanks, but the latter's product being a finished one, ready for the retail trade, it would be assessed 2¼ per cent.

A fabricator punching and otherwise finishing structural shapes and selling them to a contractor apparently would be compelled to pay the tax inasmuch as the building for which the shapes are destined would not be taxable nor would the contractor probably be considered a licensed manufacturer.

Presumably none of the materials entering into the assembly of motor vehicles would be taxed at their source inasmuch as motor vehicle manufacturers will be in the category of licensed manufacturers and will pay. Incidentally a 2¼ per cent tax on motor vehicles is much more agreeable to the industry than the originally proposed 5 per cent.

Some Imports Taxed

Importers of iron ore, manganese, refractories and other raw materials for the steel industry are in the same position as domestic producers selling for further manufacture. In other words, importations will be taxed only when they arrive in their final usable form.

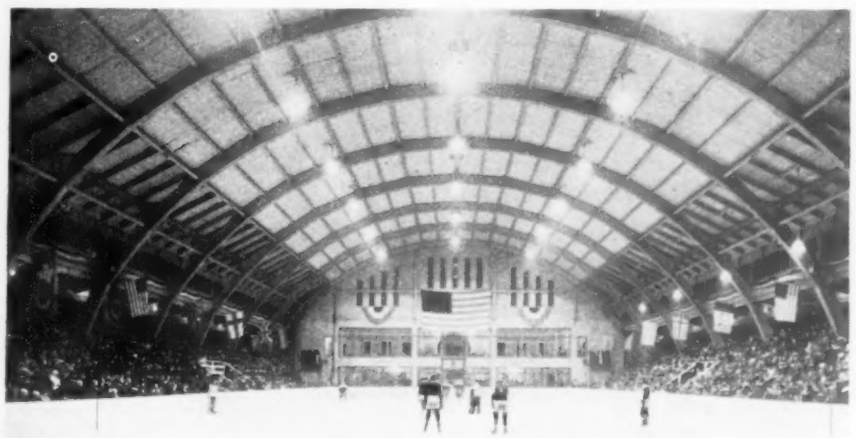
In a general way, it would appear that practically all iron ore, coke, limestone, pig iron, semifinished steel, plates, bars, shapes, sheets, tin plate and strip will be exempt, but by the same token, many wire products, rails, track fastenings and pipe will be taxable at the mill inasmuch as the purchasers will chiefly be consumers and not what could be termed licensed manufacturers.

The sale price upon which the tax is imposed will include any charge for coverings or containers but not the freight, insurance, installation or other delivery charges. A royalty is considered tantamount to a sale.

Every licensed manufacturer is to submit to the collector of internal revenue in his district a report "on or before the last day of each month for the preceding month."

In the case of contracts made prior to March 1, 1932, in which the contract does not permit adding the tax, the vendee shall be liable for the tax and the vendor shall collect such amount from the vendee. The sales tax is to be effective one month after the enactment of the bill and is to continue until June 30, 1934.

Other provisions of the revenue



STEEL AT THE OLYMPIC GAMES: Flashing blades of the hockey players fascinated thousands at the Lake Placid, N. Y., ice arena recently, but from the steelmakers' viewpoint the feature that was most interesting was the wide expanse of the building, with so little fabricated steelwork, about 250 tons. The structure, erected by the Arch Roof Construction Co., New York, with steel fabricated by the American Bridge Co., is 150 feet wide, 260 feet long, and 55 feet high

bill of 1932, which is to be expedited through both houses and while encountering considerable opposition, is expected to pass moderately promptly, increase personal income taxes, double the estate tax, impose a gift tax, levy a special tax of 4 cents a gallon on lubricating oil, place special excise taxes on telegraph, telephone, cable and radio messages, increase amusement taxes and double the present stock transfer tax of 2 cents a share.

Altogether, the measure is designed to produce $1,096,000,000 in additional revenue for the fiscal year ended June 30, 1933. None of the new taxes will be retroactive.

Rationalization Is Favored

Four hundred industrial leaders and 45 economists, circularized by the Ohio State university engineering experiment station, Columbus, O., on fundamental problems, evidenced a distinct desire to rationalize industrial processes and feel that by such rationalization a fair degree of well-being and comfort can be obtained. But as to methods of rationalization, a great diversity of opinion was shown, most industrialists opposing government interference and many economists favoring it. The results of the survey, or Circular 26, can be obtained free at Columbus.

The Business Week In Washington

WHILE the President's reconstruction program has made a profound impression throughout the country it has been difficult to get relief on the mortgage situation, resulting in some delay to construction projects, Charles F. Abbott, executive director, American Institute of Steel Construction Inc., New York, told President Hoover, March 10.

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Only 2200 immigrants entered the country in January, half the arrivals of January, 1931.

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Bessemer & Lake Erie railroad, subsidiary of the United States Steel Corp., owes the government $7,349,187 in excess income from March, 1920, to Dec. 31, 1927, under the recapture provisions of the interstate commerce act. The road has been ordered to pay this sum by April 4. The commission has recommended to congress that the recapture provisions be repealed.

Thrift the Only Unemployment Benefit Plan Approved by Metal Trades

UNWISE, hastily devised and uneconomic legislation should not be thrust upon society to retard the evolutionary process now going on, concludes a committee representing the National Metal Trades association, having made an extensive survey of unemployment benefit plans. Committee members are G. E. Randles, Foote-Burt Co., Cleveland; Dr. Otto P. Geier, Cincinnati Milling Machine Co., Cincinnati; and H. A. Sedgwick, Cutler-Hammer Inc., Milwaukee.

The committee reviews the problem in detail, analyzing 20 company plans for employment insurance, summarizes the financial status of the British and German systems, and explains the American public proposals. A warning is issued against efforts that will be made at coming legislative sessions to pass laws inimical to public interest.

Federal and state employment insurance "is unsound and is to be avoided," the committee declares. Private plans have not been in use a sufficient length of time to determine whether or not they are successful; there is no unanimity of opinion as to what the fundamental provisions of such plans should be.

"Before any attempt is made to enact laws for compulsory unemployment benefit funds, sufficient time should be allowed for experimentation which will develop the best answers to the controversial questions," the committee states. Of the company plans analyzed, by far the largest number of employes covered are those in the General Electric Co., with 78,000. This plan was put in effect in 1930. Next in importance is the "nineteen Rochester companies" plan, adopted in 1931, and covering 28,000 employes. Swift & Co.'s plan, adopted in 1912, includes 25,000 employes.

As to how the necessary experience is to be gained, the committee states: "In all probability, plans underwritten by insurance companies would offer the best fields." It recommends that state laws be revised to permit insurance companies to write such policies.

"Until the necessary experience is gained," the committee states, "the only plans for the creation of unemployment benefit reserve funds which our association could recommend to its members are those based upon systematic savings on the part of employes, with or without contributions from the employer, which are not pooled with other funds, and under which the benefits payable are in proportion to the individual's accumulated savings."

Steel's Unfilled Orders Record Further Low

Steel orders awaiting rolling by the United States Steel Corp., in declining for the eleventh consecutive month, were off 102,521 tons as of Feb. 29 when compared with Jan. 31. This made unfilled bookings 2,545,629 tons, lowest in the Corporation's history. Lack of railroad business for spring delivery is accountable in part for the February low. Monthly reports follow:

1931	Unfilled orders	Net change	Per cent change
Jan. 31	4,132,351	188,755+	4.78+
Feb. 28	3,965,194	167,157—	4.04—
Mar. 31	3,995,330	30,136+	0.73+
Apr. 30	3,897,729	97,601—	2.24—
May 31	3,620,452	277,277—	7.11—
June 30	3,479,323	141,129—	3.89—
July 31	3,404,816	74,507—	2.14—
Aug. 31	3,169,457	235,359—	6.91—
Sept. 30	3,144,833	24,624—	0.77—
Oct. 31	3,119,432	25,401—	0.30—
Nov. 30	2,933,891	185,541—	5.94—
Dec. 31	2,735,353	198,538—	6.77—
1932			
Jan. 31	2,648,150	87,203—	3.19—
Feb. 29	2,545,629	102,521—	3.88—

Sheet and Tin Plate Mill Wages Unchanged

Wage rates in sheet and tin plate mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be unchanged for March and April, due to the fact the reported sales price of Nos. 26, 27 and 28 black sheets was 2.40c per pound in January and February. The rates are 7½ per cent above base. Following is a comparison of price averages and wage changes:

Jan.-Feb., 1932	2.40c	unchanged
Nov.-Dec.	2.40c	unchanged
Sept.-Oct.	2.40c	unchanged
July-Aug.	2.40c	—3 per cent
May-June	2.50c	—4.5 per cent
March-April	2.65c	+1.5 per cent
Jan.-Feb., 1931	2.60c	—3 per cent
Nov.-Dec.	2.70c	—1.5 per cent
Sept.-Oct.	2.75c	unchanged
July-Aug.	2.75c	—4.5 per cent
May-June	2.90c	unchanged
March-April	2.90c	—4.5 per cent

Books Wire Strand

Kansas City, Mo.—Sheffield Steel Corp. has been awarded 210,000 feet, 3/8-inch, wire strand for the United States engineer here at $8.70 per 1000, delivered.

Fairchild Aerial Surveys

BEAMS FROM BROADWAY

NEW YORK

NONCORROSIVE alloy steel, Nirosta KA2, tops the spires of Lower Manhattan on the financial district's highest and newest building, the third tallest in the world—the Cities Service pile at Pearl and Wall streets. It tops the 67-story structure, 950 feet above the ground, in the form of a brilliantly polished steel spire from the tip of which burns a red light at night.

The staff proper is 125 feet high, and an airplane beacon may be mounted on the top to act as a guide for planes flying over Lower Manhattan. The chief purpose of the beacon is not so much that of a direction indicator as it is to show pilots height of the buildings in this area.

The spire was fabricated by the Babcock & Wilcox Co. Its total weight is 15,000 pounds. The lower end of the staff for a distance of 20 feet from the base is of carbon steel. The remainder is fabricated from Nirosta KA2 alloy steel which, in the finished product, is highly polished.

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The staff is in the form of the frustrum of a cone 29 inches, O. D., at the bottom and 10 inches, O. D., at the top. It was shipped in three sections with two joints completed in the field. The staff was made from flat plates, shaped, and fusion welded by Babcock & Wilcox. After welding, each section was heated to 1800 degrees Fahr. and then given an air quench. Upon fabrication, the three sections were assembled with ingenious internal locking devices which hold the several pieces together, leaving the outside smooth and free of connecting flanges.

Increasing use of steel sheets is finding a field in air conditioning and filtering. In air conditioning, the humidity and temperature are controlled. In filtering, air is just filtered. In the Rockefeller Center there will be 20,000 Maxim-Campbell silencers and air filters, made mostly of sheet steels. Not a window need be opened for fresh clean air. Outside noises of the city are stifled by a Hiram P. Maxim silencer. The Rockefeller Center silencer-filters will be especially designed, but such units in various sizes and of the same general principle are being installed in many structures already completed.

A unit weighs approximately 55 pounds, including one-twentieth horsepower motor, fan, wires and parts. There are about 20 pounds of No. 14 or 16 gage blue-painted annealed sheets. Filter screen wires are galvanized and the interior is lined with acoustic felt. The device is often fitted into radiator enclosures and is thus invisible. A rheostat on the motor permits easy control of the amount of fresh air desired and 3,800,000 square feet of office space in the Rockefeller development will be subject to this sound-proofing and air-filtering treatment.

Through Mr. Maxim's invention, noise abatement, one of the pressing problems of city life, becomes a practical commercial reality. At the same time, the problem of pure air for office workers in congested city areas is similarly solved. Scientists have determined that city air contains 10,000 particles of foreign matter in every cubic inch.

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Contracts continue to be closed for tremendous tonnages of steel and other metal for the Rockefeller Center. Fortunate is the producer or fabricator who, in these days, lands one of these blanket contracts covering needs for material for the entire project. Dahlstrom Metallic Door Co., Jamestown, N. Y., is the latest. This firm will supply 25,000 doors, frames and steel bucks, 11,000 bronze door saddles, 2,400,000 linear feet of hollow metal base and picture molding; and 200 specially decorated theatre doors for the International Music Hall and the sound motion picture theater.

The Dahlstrom company also will fabricate 3000 elevator entrances, largest contract of its kind ever awarded. All of the material with the exception of the steel door bucks will be manufactured at Jamestown. The steel bucks will be made in a branch at Bush terminal, Brooklyn.

About 7000 tons of steel, bronze paint, enamel, varnish and other materials will be used. It will take 350 freight cars to ship the finished materials from the factory to Rockefeller center.

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First column for Rockefeller Center's 70-story skyscraper was erected March 7. Almost 50,000 tons will

Says Last Word First

IMPORTANT notice—This is our rock bottom bid. It is not padded and will not stand a cut." Thus reads a sticker which the Fleisher Engineering & Construction Co., Chicago, is affixing to its bids.

be required in the construction of this central structure, the world's largest office building in floor area. Unusually heavy steel columns are being used on the foundation piers. Some sections weigh more than 60 tons each. Post & McCord are erecting the structural steel.

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Steel is the first line of defense for the world's gold and treasures. Hundreds of tons of steel are used in the construction of bank vaults, a business beginning to slow up with the completion of several large treasure chests in New York commercial structures and banks.

Work is in progress on the Bankers' Trust Co. vaults, taking 1500 tons, and the First National vaults, 800 tons. These are of Rivet-Grip construction, walls 3 feet thick. This type of construction is a highly specialized reinforcing feat, a mass of steel network, filled with concrete, to resist drills, hammers and explosives.

All steel doors in the First National vault will be 30 inches thick, weighing 50 tons each. This vault goes 65 feet below the surface and acts as part of the foundations, while the Bankers' Trust vaults are of suspended design, being built into the columns of the foundations and not being a part of it, or going into solid rock. A vault of similar design, taking about 100 tons of steel, was built into the Cities Service building.

The York Safe & Lock Co., builder of these vaults, has completed much larger ones in New York and other cities. The largest has just been completed at Tokyo for the Bank of Japan, the 17 doors and equipment weighing 3500 tons. The rivet-grip equipment is fabricated at Canonsburg, Pa., and close to 100,000 tons annually is shipped in normal times. Some of the federal reserve vaults in New York are protected by armor plate.

Financial News of Steel Industry

YOUNGSTOWN Sheet & Tube Co., Youngstown, O., reports net loss of $7,040,899 in 1931, after all charges. This compares with net income of $7,036,132, or $5.17 a share after preferred dividends in 1930.

Total assets of the company as of Dec. 31, 1931, were $236,024,088 as against $233,246,612 on Dec. 31, 1931. Surplus was $40,281,501 against $51,912,591 a year ago.

Current assets including $9,456,249 cash amounted to $73,238,379 and current liabilities were $6,067,148. This compares with current assets of $80,531,564 and current liabilities of $12,280,362 at the close of 1930.

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National Steel Corp., Pittsburgh, directors March 10 declared a quarterly dividend of 25 cents a share, thus halving the former $2 annual rate. The dividend is payable March 30 to record March 21.

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Taylor-Wharton Iron & Steel Co., High Bridge, N. J., reports net loss after interest and other charges in 1931 of $333,906, against $89,742 net loss for 1930.

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American Rolling Mill Co., Middletown, O., in recent statement reports net loss of $3,098,445 after charges for 1931. This compares with 1930 net income of $114,094, equal after preferred dividends to 3 cents a share.

As of Dec. 31, 1931, the company showed current assets of $28,130,382 and current liabilities of $4,217,918, comparing with $34,196,436 and $4,794,689, respectively, at the close of 1930. The company operated at 37.2 per cent of capacity during 1931.

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Bucyrus-Erie Co., Milwaukee, shows net income of $823,927 for 1931, equivalent after preferred dividends to 82 cents a share. This compares with $2,439,461, or $1.63 a share in 1930.

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Eastern Rolling Mill Co., Baltimore, reports operating loss of $351,003 in 1931, and net loss after depreciation and all charges of $514,888. This compares with net loss of $589,896 in 1930.

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Otis Steel Co., Cleveland, reports net loss of $1,571,342 in 1931, against net income of $868,730 in 1930. During 1931, before depreciation and bond interest, there was an operating profit of $264,370. Maintenance and renewal charges in 1931 totaled $1,377,541.

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Gulf States Steel Co., Birmingham, Ala., reports net loss of $976,230 for 1931, against net loss of $815,334 in 1930. Gross income for 1931 was $7,859,048, which less cost of operations, left an operating profit of $121,461. Interest and depreciation items totaled $1,097,691. As of Dec. 31, 1931 current assets, including $432,675 in cash, amounted to $3,906,252 and current liabilities, $1,516,754. January, 1932, is said to have made an operating profit of $60,000.

Shortening of Work Day To Speed Mechanization

FAR from solving the problem of labor surplus, a general adoption of shorter working periods would seem to be the signal for a more intensive endeavor to reduce costs by replacing human labor by machinery," says the National Industrial Conference board, New York, in discussing factors affecting shorter work schedules.

Most agitation for shorter hours is based on the assumption that more jobs will be created. Shortened schedules in many instances tend to increase costs. . . . and, as the board states, "if a manufacturer finds his costs rising as a result of a shortened schedule he will redouble his efforts to reduce costs, and the obvious means for accomplishing this will be to install still more labor-saving machinery."

The board "is not clear that the additional leisure reduced schedules will give employes will result in greater consumption of commodities in general."

Capital equipment must be used to the fullest extent if the greatest return is to be obtained from it before depreciation has taken its toll. A plant might be operated, the board suggests, from 6 a.m. to 6 p.m., with shifts changing at noon—12 full productive hours "with probably a greater output per hour than on a one shift 8-hour or 9-hour day, because the fatigue factor toward the end of the day does not become operative." Capital equipment would be used 60 or 72 hours per week instead of 48, 40 or 36.

Business Is Better

ALLIS-CHALMERS MFG. CO., Milwaukee, reports sales of industrial tractors since Jan. 1 five times larger than in the same period in 1931. The company's tractor plant at Springfield, Ill., is operating 6 days a week. Prospects for agricultural tractor sales in the southwest are more favorable than a year ago despite the drought.

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Superior Charcoal Iron Co., Grand Rapids, Mich., reports February sales the best in a year. More than 50 new accounts were opened by the company in 1931, and if the rate of accessions in January and February is maintained, the showing for 1932 in this respect will be even better.

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Chicago & North Western railroad is reopening its car shops at Chicago which went down last October. The road is starting with a force of 450 shopmen. The road's locomotive shops reopened Feb. 3 with 500 men.

Chicago & Alton shops at Bloomington, Ill., resumed with 125 men.

Scrap Dealers Attack Tight Credit; Win on Trade Rules

WASHINGTON — Hoarding of funds by banks and their restrictive credit policies are noticeably curtailing the activity of the iron and steel scrap industry and thereby creating a serious drain upon the comparatively limited iron ore resources of the nation, a delegation of members of the Institute of Scrap Iron and Steel Inc., in convention here, told President Hoover, March 9.

Scrap is an excellent investment for banks because it is at the lowest price in the history of the industry, declared Benjamin H. Schwartz, executive director of the institute. Were it not for the increasing use of scrap, the country's high grade reserves of iron ore would be exhausted by 1960, the President was informed.

In turn, the President requested the submission of the names of banks not co-operating with the Reconstruction Finance Corp. program of liquefying credit.

Trade Practice Rules Restored

Meeting with Commissioner Ferguson of the federal trade commission, officers of the institute apparently won the restoration of two trade practice rules which the commission had deleted. One of the rules condemns the failure of dealers or brokers to pass on the credit for overweight; the other condemns the mailing of misleading price lists.

Changes were made at the scrap revision conference in connection with the 75 classes. Bolling Galt, of the department of commerce, who acted when the revision was originally worked out, was chairman of the meeting. At this meeting a standing committee also was provided for, composed of various factors of the steel industry to work out further revisions. This committee will be appointed later by Mr. Galt. The conference defined alloy scrap.

A conference of exporters was held during the convention, when it was definitely decided to go ahead with the formation of a Webb-Pomerene export corporation. Mr. Schwartz was authorized to appoint a committee to work out all of the details of such an organization and to go ahead with it at once. Miss Helen M. Love, chief of the export trade section of the federal trade commission, explained the working of the Webb-Pomerene act regarding export corporations.

The convention adopted a resolution asking that members of the institute in their scrap dealings give preference to other members of the institute. Another resolution provided for the appointment of a committee on business ethics with power to expel members from the institute for violations.

The second institute award was made to W. W. McMillan, purchasing agent of the National Malleable & Steel Castings Co., of Cleveland, and chairman of the iron and steel committee of the National Association of Purchasing Agents. Award for the outstanding chapter of the institute was made to the New Jersey chapter; the Cincinnati chapter was given honorary mention.

Benjamin Schwartz

Officers elected for the ensuing year include Herman D. Moskowitz, New York, as president and the following vice presidents: Myron A. Cohen, Cleveland; Frank Parker, Chicago; Charles Dreifus, Pittsburgh; Ben Cohen, Wilkes-Barre, Pa.; and Ben P. Williams, St. Louis; secretary, Walter Erman, Chicago; treasurer, Thomas F. Kelly, New York. Phil Frider, Youngstown, O., was made chairman of the executive committee.

The following were added as members of the board of directors for a 3-year term: Ben Cohen, Wilkes-Barre, Pa.; Michael V. Bonomo, Jersey City, N. J.; Charles Dreifus, Pittsburgh; William M. Hilb, Cincinnati; Ben P. Williams, St. Louis; Walter Erman, Chicago; Harry Grant, Detroit; and Lee J. Workum, Portsmouth, O.

Charles F. Abbott, executive director, American Institute of Steel Construction, New York, carried his war against the stranglehold of the antitrust laws into the banquet of the institute, March 10.

The antitrust laws, he pointed out, were enacted not to prohibit co-operation but to preserve competition. Failure to permit corporate units to engage in economic co-operation has resulted in greater evils than those which these laws sought to prevent, declared Mr. Abbott.

Would Have Aided in 1920, 1930

"Co-operation in 1920 would have mitigated the severity of the credit inflation," said Mr. Abbott. "Trade co-operation in its fullest sense in 1930 would have preserved to the United States a fair amount of business prosperity, checked the rate of deflation and saved many of the weaker concerns which have been forced either into bankruptcy or to merge with their stronger commercial rivals.

"It is a mistake to think that price fixing is the ultimate aim of stabilization. American business is volatile and requires greater freedom than would be permitted under any definite plan of price fixing. But that is no indication that we do not require greater stabilization in our marketing plans and I firmly believe that we can attain it effectively within the prohibitions of our existing laws.

"If there ever was a time when the trade associations should receive united moral and financial support it is during periods of distress. It is then that the combined energies of an industry should be set in motion and move forward aggressively. It is no time to retire or withhold support and those who do are actually the ones who are preventing the progress that they, themselves, are most concerned in."

Canada Leads Japan

In 1931 Japan dropped to second place as a purchaser of American iron and steel scrap, after holding the lead for 2 years, declared Luther Becker, chief, iron and steel division, department of commerce, in addressing the institute.

Last year Canada took 68,210 gross tons of scrap, compared with 48,036 tons by Japan. These two consumers accounted for the great bulk of the total of 136,125 tons exported. China last year purchased 7026 tons from the United States; Hong Kong, 980 tons; and Kwantung, 22 tons.

In 1930 total exports of scrap from the United States were 358,649 tons, of which Japan took 168,186 tons. In 1929 exports amounted to 557,044 tons, of which Japan accounted for 208,260 tons.

Industrial Men in the Day's News

Everett D. Graff, First Vice President, Joseph T. Ryerson & Son Inc., Chicago

HE has been identified with the Ryerson organization for 26 years, and at one time was Pittsburgh representative for the company.

PRIOR to the World war, he controlled the purchasing policies of the company at Chicago.

DURING the war, he served in the steel supply division under J. Leonard Replogle.

EVERETT D. GRAFF, recently elected first vice president of Joseph T. Ryerson & Son Inc., Chicago, as noted in the Feb. 1 issue of STEEL, came to this position with many years of experience. He has been a member of the Ryerson organization since 1906.

In 1909 he became Pittsburgh representative of the company, and served in that capacity until 1914. Returning to Chicago for a special sales assignment, he was soon made director of purchases, and for some years controlled and guided purchasing policies, which are decidedly important to a business such as the Ryerson company.

During the war Mr. Graff served in the steel supply division of the war industries board of the Council of National Defense under J. Leonard Replogle, director of steel supply. When this work was completed, he returned to Chicago as assistant to the vice president of the Ryerson company.

Mr. Graff was elected vice president in 1927 and a director in 1928, and has directed activities in connection with certain specialty sales in addition to his purchasing and other general responsibilities.

His election as first vice president is a recognition of his broad experience and natural qualities of leadership. While Mr. Graff's activities in the steel business occupy much of his time, he also has time for collecting old and rare editions.

Mr. Graff is a member of a number of associations and clubs in and about Chicago.

J. S. FRASER, who became associated with the Trumbull-Cliffs Furnace Co., Warren, O., during the construction of the company's furnace in 1920-21 and has been general superintendent since its completion, has resigned effective April 1. He joins H. A. Brassert & Co., Chicago, as a consulting and operating engineer abroad. He gained notice as one of the earliest advocates of the slow-driving system for blast furnaces, the system providing that at the end of the cast the relief valve is closed and with the blowing engine idling the furnace smelts at a reduced rate. This system has been rather generally adopted, being suitable and economical for the times.

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Howard H. Cook, secretary, American Iron and Steel institute, New York, is on a short leave of absence, due to illness.

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W. J. Gibney recently was appointed vice president, Chemung Foundry Corp., Elmira, N. Y.

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Edward W. Kipp has resigned his executive position with Gould Pumps Inc., Seneca Falls, N. Y., to devote full time to his office as mayor of that city.

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Carl Edward Johansson, of the Ford Motor Co., Detroit, has been awarded the John Ericsson medal by the American Society of Swedish Engineers in recognition of his invention of apparatus which accurately measures two and a half ten-millionths of an inch.

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Ben C. Scott, with headquarters in San Francisco, has been appointed Pacific coast sales manager for the Wickwire Spencer Steel Co., New York. Mr. Scott is widely known in the wire and wire products field on the Pacific coast. He had been manager for Wickwire Spencer company at Los Angeles and since the death of W. H. Bissell, had been acting Pacific coast sales manager.

Grant Fox, for many years identified with the sale of wire products on the Pacific coast, has joined the Pacific coast sales organization of the Wickwire Spencer company, with headquarters at San Francisco.

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G. A. Seyler, Lunkenheimer Co., Cincinnati, has been elected president of the Cincinnati branch of the National Metal Trades association, Chicago. H. A. Feldbush, of the Worthington Pump & Machinery Corp., has

been named vice president; P. G. March, with Cincinnati Shaper Co., treasurer; and B. B. Quillen, of the Cincinnati Planer Co., secretary.

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Gordon W. Scott has been elected a director of General Steel Wares Ltd., Montreal, Que. Other directors have been re-elected.

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Linn C. Ross has been elected a director of the Ross Gear & Tool Co., Lafayette, Ind., to succeed H. A. Dick, former vice president. All other directors and officers have been re-elected.

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W. C. Lytle, Evanston, Ill., has terminated his connection with the Pangborn Corp., Hagerstown, Md., with which organization he was active for 16 years, and during the past 10 years was district sales engineer for that firm in Chicago.

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C. R. Hammer has been elected a director of the McCord Radiator & Mfg. Co., Detroit, succeeding W. C. Winter, who has resigned. L. M. Hamlin has been elected treasurer to succeed Mr. Hammer in the latter position.

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William F. Drysdale has been appointed vice president in charge of sales for the Montreal Locomotive Works Ltd., Montreal, Que.

H. C. Butler has been named vice president in charge of manufacturing for the company.

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Albert E. Grover, cost consultant, Berea, O., and prior to Oct. 15, 1931, cost consultant with the National Machine Tool Builders' association, Cincinnati, has been named cost director of the Gray Iron Institute Inc., Cleveland.

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O. R. Whitaker, of Denver, consulting engineer for the Molybdenum Corp. of America and president of the Ahumada Lead Co., has been elected president of the Black Hills Consolidated Mining Corp., Deadwood, S. Dak.

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J. C. Fitzpatrick, former district sales manager at Cleveland for Chicago Pneumatic Tool Co., New York, has been transferred to the New York office where he will be associated in a sales capacity with the New York district.

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C. W. Ross, formerly with the Philadelphia office of C. O. Bartlett & Snow Co., Cleveland, has been transferred to New York, where he will be associated with W. H. Norrington, New York manager, in the sale of conveying, drying and crushing machinery.

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Frederick Wille has resigned as chief engineer of H. A. Brassert & Co., consulting engineers, of Chicago. A. J. Hulse, assistant chief engineer, has been appointed chief engineer, and C. E. Dougan, chief draftsman, has been appointed assistant chief engineer.

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Frederick E. Williamson, president of the New York Central railroad was honored at a dinner given by George Gordon Crawford, president of the Jones & Laughlin Steel Corp., Pittsburgh, at the Duquesne club, Pittsburgh, March 9. The dinner was attended by several hundred prominent men in steel, railroad and industrial circles.

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H. E. Graham, assistant vice president of the American Car & Foundry Co., New York, has been appointed assistant to the president and general traffic manager of the Jones & Laughlin Steel Corp., Pittsburgh. Mr. Graham will assume his new duties April 1. He formerly was with the Pressed Steel Car Co. at Pittsburgh. In his new position he succeeds the late F. A. Ogden.

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Gen. Otto H. Falk, president of the Allis-Chalmers Mfg. Co., has been elected a director of the Harnischfeger Corp., Milwaukee, to succeed J. O. Eaton, Cleveland. The addition of General Falk to the board fulfills the desire of the late Henry Harnischfeger and of present principals in the corporation that he become associated with the company. All other directors were re-elected at the annual meeting of stockholders, and directors re-elected all officers.

Obituaries

WILLIAM H. MULLINS, 76, president of the Mullins Mfg. Co., Salem, O., died at Salem, March 6. The company was founded by Mr. Mullins and associates in 1882, and in 1890 he bought out his partners' interests. The company first engaged in art metal work and metal stamping, but in 1905 began making steel bodies for automobiles, washtubs and refrigerators. He retired from active management of the company in 1923.

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W. W. Babcock, 64, president, Babcock Mfg. Co., Bath, N. Y., died at Bath recently.

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Harry G. Thomas, 46, production manager of the Okanite department, Hazard Wire Rope Works, Wilkes-Barre, Pa., died at Wilkes-Barre, March 7.

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William J. Hess, 76, founder of the Menasha Boiler Works, Menasha, Wis., died March 7. He was a native of Wisconsin but engaged in manufacturing metal products in Sheboygan and Saginaw, Mich., before going to Menasha in 1918 to establish the boiler works bearing his name.

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William L. Austin, 79, former president and chairman of the Baldwin Locomotive Works, Eddystone, Pa., died at Philadelphia recently after a 2-year illness.

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Henry Ehret, 76, founder and president, Oakland Foundry Co., Belleville, Ill., died recently in that city. He was a pioneer foundryman, and introduced numerous developments in foundry practice.

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James C. Norton, 26, son of Elliott C. Norton, New York, who founded the Acme Steel Co., Chicago, died March 6 at Jamestown, N. Y. He was identified with a Rochester, N. Y., advertising agency.

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Lloyd A. Sagendorph, 47, president of the Penn Metal Co., Philadelphia, died at Philadelphia, March 8. A native of Cincinnati, he was a graduate of the University of Pennsylvania in 1908 as a mechanical engineer.

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Hugh R. Corse, 52, affiliated with the sales department of the Lumen Bearing Co., Buffalo, died recently. He was active in automotive circles, having been a member of the Society of Automotive Engineers, Buffalo Engineering society and other technical bodies.

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George Stroh, 67, founder and president, Stroh Die Moulded Casting Co., Milwaukee, died March 2 after an illness of a year and a half. He was born in Jordan, N. Y., and went to Milwaukee in 1904 to enter the die casting business, building up one of the largest shops of the kind in the central states.

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Hermann Fougner, 55, formerly associated with the American Steel & Foundry Co., Truscon Steel Co., United States Shipping board and Standard Oil Co., of New Jersey, died at New York, March 9. He was founder and president of the Fougner Steel Co., which went out of business in 1922.

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Frank A. Walsh, 84, pioneer inventor and manufacturer of machinery for making tin cans and other containers, died in Milwaukee March 5. He was born in East Greenwich, R. I., in 1847 and entered the Civil war service at 15. After the war he became a machinist and went into business on his own account at Chicago, moving his plant to Milwaukee in 1883. Mr. Walsh retired about 25 years ago.

Novo Engine Co., Lansing, Mich., has increased production in its foundry department.

February Maintains Tradition Of Rise in Ingot Output

OUTPUT of open-hearth and bessemer steel ingots, on a daily average basis, increased in February for the second consecutive month, reaching 58,382 gross tons daily, compared with 56,203 tons in January and 104,265 tons in February, 1931.

February thus is true to the tradition that it improves upon the seasonal rise usually beginning in January. In 1931, daily output increased from 91,063 tons in January to 104,265 tons in February to 115,138 tons in March, then went into a decline that was not checked until November. A year ago the increase in daily output from January to February was 14 per cent, whereas the increase from January to February this year was only 3.7 per cent.

February total output of 1,459,547 tons gives the first two months of 1932 a total of 2,920,837 tons. In the first two months of 1931, production amounted to 4,961,055 tons.

Steelmaking capacity, according to the American Iron and Steel institute, New York, was engaged 27.57 per cent in February, compared with 26.54 in January and 49.08 in February a year ago. The daily average rate thus far in 1932 has been 57,271 tons or 27.05 per cent of capacity; in the same period of last year the average daily output was 97,276 tons and the rate 45.79 per cent.

Here and There In Industry

INTERNATIONAL-STACEY CORP., Columbus, O., has completed delivery from its Ideco plant at Torrance, Calif., of all the structural steel for the erection of two bridges across the Colorado river at Hoover dam by the Six Companies, Boulder City, Nev. The bridges are suspension structures. One is 408 feet between towers and requires about 160 tons of structural steel. The other is 391 feet between towers and requires 125 tons of structural steel. Each is 20 feet in width, with 16-foot roadway and a walkway 2 feet, 6 inches wide. They are hung from 2-inch bridge cables, eight to each bridge. For the longer bridge they are 657 feet long and for the shorter they are 564 feet long. Trusses were shipped in sections from the Ideco plant at Torrance. The bridges will be used by the contractors in transportation of material from one side of the river to the other.

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Aerocar Co. of Detroit Inc., Detroit, builder of van bodies, ambulances, trailer bodies and similar products, is negotiating with the Milwaukee association of commerce with a view to moving its plant to Milwaukee.

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Clark Controller Co., Cleveland, has appointed David O. Stewart, 619 Bank of Commerce building, St. Louis, its representative in St. Louis and surrounding territory. Mr. Stewart will also represent the company's allied interests, Sundh Electric Co., Newark, N. J., and Una Welding Inc., Cleveland.

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McClintic-Marshall Corp., Bethlehem, Pa., has moved its Cleveland sales office from 1538 Hanna building to 2609 Terminal Tower.

Kalman Steel Corp. has moved its Cleveland offices from the Western Reserve building to 2600 Terminal Tower, which is the Cleveland office of Bethlehem Steel Co.

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American Cooling & Refrigerating Systems Inc., Wisconsin Rapids, Wis., has been organized to take over the plant and machinery of the National Carbonic Machinery Co., at Wisconsin Rapids, manufacturer of heavy-duty refrigerating plants. The new company is capitalized at 4500 shares without par value.

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Production Tool & Die Co. Inc., Springfield, Mass., which took over the plant of the Hampden Tool Co., Springfield, is introducing a new series of die sets of its own design in ten sizes, which shortly will be expanded to 20 sizes. The company is prepared to do engineering and manufacturing covering the tool, die, metal stamping and special machinery fields.

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Waterous Ltd., Brantford, Ont., has obtained rights to manufacture gasoline road rollers from the Buffalo-Springfield Roller Co., Springfield, O. It also has organized the Pioneer Equipment Co. of Canada Ltd. to manufacture gravel, stone-crushing, screening and washing plants manufactured by the Pioneer Gravel Equipment Co., Minneapolis. W. H. P. Thompson, Minneapolis, is president.

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McQuay-Norris Mfg. Co., St. Louis, manufacturer of piston rings, is establishing a branch plant on a site of four acres in York township, near Toronto, Ont. The first unit, costing $60,000 will be started immediately and the complete plant will contain six units at a cost of $500,000. Nelson A. Hardie, for some time the company's Canadian representative, will be manager of the new plant.

Steel Ingot Production—1931-32

95.21 Per Cent of Industry Reporting
Gross Tons

1931	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approximate daily output all companies	Per cent operation
Jan.	2,044,298	296,620	2,340,918	2,458,689	27	91,063	42.86
Feb.	2,085,529	296,974	2,382,503	2,502,366	24	104,265	49.08
2 mo.	4,129,827	593,594	4,723,421	4,961,055	51	97,276	45.79
Mar.	2,504,060	346,137	2,850,197	2,993,590	26	115,138	54.20
Apr.	2,275,404	316,668	2,592,072	2,722,479	26	104,711	49.29
May	2,083,833	301,639	2,385,472	2,505,485	26	96,365	45.36
June	1,730,109	246,365	1,976,474	2,075,910	26	79,843	37.58
July	1,570,776	225,030	1,795,806	1,886,153	26	72,544	34.15
Aug.	1,462,469	174,631	1,637,100	1,719,462	26	66,133	31.13
Sept.	1,274,321	199,151	1,473,472	1,547,602	26	59,523	28.02
Oct.	1,320,158	195,943	1,561,101	1,592,376	27	58,977	27.76
Nov.	1,276,906	240,441	1,517,347	1,593,684	25	63,747	30.01
Dec.	1,069,468	170,546	1,240,014	1,302,399	26	50,092	23.58
Total	20,697,582	3,009,894	23,707,476	24,900,195	311	80,065	37.69
1932							
Jan.	1,230,661	160,633	1,391,294	1,461,290	26	56,203	26.54
Feb.	1,232,568	157,067	1,389,635	1,459,547	25	58,382	27.57
2 mo.	2,463,229	317,700	2,780,929	2,920,837	51	57,271	27.05

Figures exclude crucible and electric ingots. Operating percentages for 1930 are based on capacity of 62,265,670 gross tons as of Dec. 31, 1929; for 1931 on capacity of 66,069,570 gross tons as of Dec. 31, 1930.

MIRRORS of MOTORDOM

DETROIT

HENRY and Edsel Ford and Charles E. Sorensen on March 9 pronounced a V-eight engine as the master of the forthcoming series and stamped No. 1 on it. Obviously, this is a big step toward volume production, but it is not to be confused with car No. 1 leaving the assembly line.

Complete eights—body and engine—already have been assembled by hand. It is reasonable to expect that within a week or ten days the last details of the bodies will receive a benediction, and the start of what might be called regular production is only a matter of days.

Up to the end of last week no tonnage orders for steel and no quantity releases of parts had been issued. But for practically all body parts—and now for all engine parts—specifications are available, and it is believed some suppliers have anticipated releases and built up small banks for immediate shipment.

The delay attending final decisions on the new Fords and the last minute changes ordered by Mr. Ford himself are reminders of the situation at the Fordson plant late in the fall and early in the winter of 1927, when Model A was being born. From Model T to Model A was a wider gap than from Model A to the new line, but with two new motors and an entirely revised body, the early production record of Model A may give a hint of forthcoming schedules.

100,000 In Five Months

On Dec. 2, 1927, the first A came off the line, 550—some of them virtually hand-made—being shipped to "key" cities for early display. By Dec. 30 production had been speeded up to about 300 units daily. The 1000 daily rate was crossed on Feb. 14, 1928. No. 100,000 was assembled in early May, about 5 months after No. 1 was assembled.

It was in July, 1928, that a rate of 3000 units daily was attained, and by Dec. 2, 1928, in exactly one year, a total of 704,669 units had been made. At that time production was speeded up to 6500 units a day. In 1929 a peak of just under 9000 units daily was reached.

If the past is any guide to the future, and to the 100,000 cars required to stock Ford dealers are added the 70,000 or so now reported sold, Ford operations may be expected to be speeded up as rapidly as possible and to be on a rising trend at least until early fall. In the meantime, a more favorable turn in the retail market would continue this period.

Ford Governs March Gain

Incidentally, it is regarded as an unkind fate that prompted communist activity and rioting at the gates of the Ford Motor Co. No manufacturer has been more sympathetic with Soviet Russia, whose engineers have been given much latitude at Fordson, and in construction of the Russian plant which will manufacture a car equivalent to the Ford no little co-operation has emanated from Detroit.

Ford continues the key to March production. February output of cars and trucks is unofficially placed at about 118,000, or about 8000 under January. The estimate for March is 150,000 units, but this is contingent upon Ford getting into production for the last third of the month.

Chevrolet, which has increased its weekly assemblies from 11,000 units to 12,000, has increased the work week of its gear, axle and forging plant in Detroit from 48 hours to 56. This will lift its March production 6000 to 7000 units above February, and indicates a mild rise in retail sales in spite of the drag which Ford has been on the low-price market.

In Chevrolet's expansion there is encouragement for other low-price manufacturers. It is believed that the showing of the new Ford will develop not only actual orders but it will also bring decisions from many potential buyers now on the fence. There is some speculation that with the new Ford and new Plymouth shortly available, automobile purchasing may solve the hoarding problem by inducing buying and putting idle funds into circulation via Detroit.

In the meantime, minimums rule in the assembly plants of most the other motor plants. Chrysler, Cadillac, Dodge, Graham, Reo and Studebaker were the makers who curtailed last week.

Hudson-Essex assemblies kept in line last week with the preceding week. This meant average assemblies on both cars aggregating 1700 cars.

Graham receded a little last week, presumably a slight reaction after the company's good showing of late 1931 and the beginning of 1932. Last week just over 425 models were assembled from the week before of over 675 when assemblies were on a five-day week.

Dodge On 4-Day Week

Dodge has reduced its working days on passenger cars on 4, but daily schedules remain the same at just over 225 units each. A drop in truck output was recorded, to 180 manufactures for the week. Chrysler made 710 cars last week, down slightly. Plymouth was better, gaining in assemblies by over 400 to 950 the week.

Still on a three-day week, Olds made 255 models a day last week. Pontiac is working on a 7300-unit March, and at the half-way mark is adhering to it. That division of General Motors is still producing on a five-day week, 370 daily. Packard has gained due to its light eight.

EDITORIAL

Specialization Is Changing Role of Steelmaker

IN THE brief half-century of steel's important service to American manufacturing, the role of the steelmaker has undergone a change so gradual that it has escaped the notice of many, yet so significant that it must challenge the attention of those who guide the destiny of the industry. We refer to the seemingly inevitable trend by which control of the utilization of steel is being shifted from steel producers to fabricators and users of steel.

Late in the last century the great bulk of steel output was prepared for use by the companies that made the steel. At that time the railroads and farms were the most important consumers. It was the crucible steel producers who developed laminated steels for plow shares and mould boards. The wire mill interests perfected barbed wire and woven wire fencing, thus furnishing the farmers with finished products. It was the steelmakers who found a way to roll steel wheels and tires for cars and locomotives. It is safe to say that in the first half of the "steel age," steel producers performed the lion's share of the work involved in applying steel to the needs of industry. In general, they finished steel processed and ready for use.

Producers Gradually Losing Control of Secondary Operations on Steel

Beginning with the advent of the motor car, the control of operations on steel subsequent to its delivery from the rolling mill passed more and more from steelmakers into the hands of specialists. It is true that steel rails, wire fencing, much of the steel pipe, and a large tonnage of plates, shapes and bars still go from steel companies to consumers in finished form ready for use except for simple assembly operations. But a steadily increasing tonnage goes to intermediate fabricators or to manufacturers for heat treating, forming, welding, riveting, machining, finishing, etc. before it is ready for assembly.

For instance, bolts, screws and rivets once were predominantly the products of steel companies, but today there are scores of manufacturers who buy the steel and specialize in turning out these articles. Makers of sheet and strip steel have overcome many obstacles in developing material suitable for automobiles, furniture and pressed parts, but the successful application of their product in these markets depends in large degree to the skill of the fabricators or users who must shape, weld or rivet, and otherwise finish it before it can be used. Likewise the processing and treatment of steel for numerous components of automobiles, locomotives, cars, ships, machinery and industrial equipment now is the responsibility of specialists rather than that of the steelmaker.

Greater Variety of Steels Emphasizes Necessity for Specialization

As time goes on this tendency is more likely to increase than to diminish. The activity of steel producers in introducing new steels in greater variety of analyses, shapes and physical properties in itself encourages specialization. The more intricate the material the greater is the need for concentration on the problem of applying it successfully. This is especially true of some of the more recent steel products such as full finished and deep drawing sheets and strip, corrosion-resisting alloys of steel, certain cold-finished machinery steel, etc. Recent developments in welding, heat treating, and coating, polishing and finishing call for an operating technic which is best controlled by companies set up to give expert attention to one or more of these specific problems.

Steelmakers need not be alarmed at the continued growth of specialization in the secondary operations on steel, but they will do well to consider this factor when formulating future merchandising policies. In the revolutionary changes in the functioning of the steel industry that are bound to take place in the current decade, the relations between producer, fabricator and user will be revamped, improved and clarified. Somewhere in this process, provision must be made for closer liaison between the making, application and use of steel.

In the meantime much can be done by facilitating the exchange of experience. To this end, STEEL inaugurates in this issue a new department, "Making the Most of Steel." In it will be found useful information on methods involved in the successful application of steel. We hope it will prove to be a worthy companion of "Progress in Steelmaking," the popularity of which is evidenced clearly by the volume and character of correspondence relating to it which is received by the editors.

THE BUSINESS TREND

Industry Awaits Effect of Credit Liberalization

BUSINESS has responded little, if at all, to the encouraging progress being made in the campaign against financial evils. The reduction in the number of bank failures is gratifying. The volume of money in banks is increasing. All along the line there are evidences of an easier credit situation, but to date the effect of this improvement has not been reflected in the state of business.

This is not surprising because the inertia to be overcome is tremendous. Improvement in business activity will be governed in considerable degree by the speed with which present efforts to liberalize credit dispel the fear which still rules the acts of a large part of the population. It is a slow process, but marked progress is being made.

Within the week England gave the world a lesson which should prove salutary in many countries. By dint of stern measures she has lifted herself out of the depths of despair. She is repaying loans before they are due. Her budget will be balanced by the end of the year.

The example of England should be reassuring to the United States, but more than that, her experience should emphasize to us the necessity of inaugurating more drastic correctives in connection with our national budget. Thus far the proposals at Washington for reducing government expenses fall far short of what should be reasonably expected.

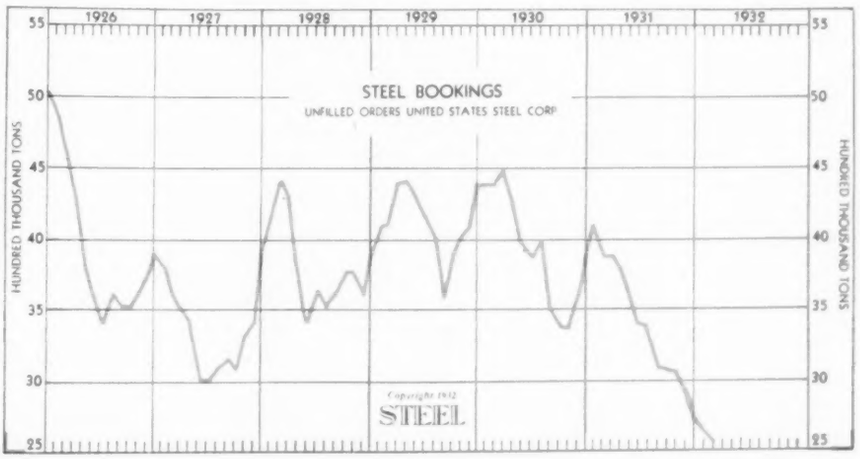
Industrial activity is fluctuating within a very narrow range. Steel ingot production in February fell short of the January total by a slight margin. Somewhat to the surprise of many observers, the daily average actually was higher than that of the first month.

No Change in Trend of Steel Orders, Freight Traffic and Prices

The decline in unfilled orders of the United States Steel Corp. was expected. The backlog of 2,545,629 tons as of Feb. 29 compares with 2,648,150 at the end of January and is the lowest point to which unfilled orders have gone in the history of the corporation.

Car loadings dropped sharply in the week ending Feb. 27. A recession at this time appears to be seasonal, inasmuch as similar declines have occurred in late February in past years. According to the trend in recent years, a gain throughout March is to be expected.

Commodity prices still present an uncertain aspect. Strength in wheat, corn and cotton is noted, but iron and steel prices—still untested—lack positiveness.



1932	
Feb.	2,545
Jan.	2,648
1931	
Dec.	2,735
Nov.	2,933
Oct.	3,119

1931	
Feb.	3,965
Jan.	4,132
1930	
Dec.	3,943
Nov.	3,639
Oct.	3,481

January Steel Casting Orders Establishes Low

At 11.8 per cent of capacity, new orders for commercial steel castings totaled only 17,393 tons, whereas the 130 establishments reporting to the department of commerce have a capacity of over 146,000 tons monthly. Actual production in January also fell beneath December, 1931, and capacity in January was engaged at only 12.5 per cent. The following compares monthly orders and output:

1931	Total bookings tons	Per cent of capacity	Total production tons	Per cent of capacity
Jan.	46,810	32.1	46,294	31.8
Feb.	40,320	27.7	49,548	34.0
March	48,184	33.1	56,755	39.0
April	46,039	31.6	48,282	33.2
May	39,052	26.8	43,154	29.6
June	26,136	18.0	35,018	24.1
July	32,869	22.6	31,751	21.8
Aug.	27,458	18.9	30,186	20.7
Sept.	23,073	15.8	26,948	18.5
Oct.	22,854	15.7	24,113	16.6
Nov.	20,001	13.7	23,139	15.9
Dec.*	20,799	14.3	22,064	15.2
Year*	393,595	22.5	437,252	25.0
1932				
Jan.**	17,393	11.8	18,395	12.5

*Revised. **Preliminary.

Midwest Accounts for Gray Iron Increase

January gray iron production showed a slight increase over December, due to increased activity in the Ohio, Pennsylvania, Michigan and Indiana district, according to the monthly trade report compiled by the Gray Iron Institute Inc., Cleveland.

Production in this area increased from December's 34.1 per cent to 41.1 per cent in January, while production in the other districts declined slightly. Total production for the month was 37.8 per cent of normal, compared with 37.6 per cent for December. New business was 35.4 per cent, compared with 30.7 while unfilled orders were 28.9 compared with 22.6.

Increased activity was reported in foundries over 251 tons capacity per month. Smaller foundries showed decreased activity.

Steel Furniture Orders Make Moderate Gain

Improvement in new orders for the business classification of steel furniture occurred in January, although shipments fell off from the December year-end total. New orders for shelving failed to improve along with business furniture, nor did shipments in the former class. Department of commerce reports the following by 52 important units in the industry.

(In Dollars, 000 Omitted)

1931	Business Group New orders	Business Group Shipments	Shelving New orders	Shelving Shipments
Jan.	1,840	1,768	417	422
Feb.	1,478	1,563	401	382
March	1,487	1,522	455	481
April	1,424	1,481	408	423
May	1,306	1,305	506	409
June	1,272	1,221	452	449
July	1,092	1,074	328	371
Aug.	1,010	1,057	307	358
Sept.	1,059	1,188	304	310
Oct.	1,114	1,078	304	310
Nov.	910	956	267	226
Dec.	911	1,075	295	298
Year	14,903	15,287	4,447	4,440
1932				
Jan.	966	977	267	269

Babbitt Metal Output Continues Restricted

Total production of babbitt metal in 1931 was approximately 26,000,000 pounds, comparing with 42,752,921 in 1930, and January's figure, according to the department of commerce, continues at the same depressed rate as during November and December, 1931:

In Pounds

1931	(a) Total production	(b) Sales	(c) Production for own use
Jan.	2,855,693	2,089,574	766,119
Feb.	2,507,222	1,819,749	687,473
March	2,661,211	1,829,477	831,734
April	2,560,243	1,844,311	715,932
May	2,408,781	1,678,204	730,577
June	2,306,940	1,605,009	701,931
July	1,931,685	1,420,265	511,420
Aug.	1,780,900	1,376,692	404,208
Sept.	1,851,956	1,355,415	496,541
Oct.	2,047,100	1,495,185	551,915
Nov.	1,846,069	1,239,032	607,037
Dec.	1,624,419	1,047,607	576,812
Year	26,020,025	18,438,326	7,581,699
1932			
Jan.	1,743,837	1,281,294	462,543

(a) By 43 plants. (b) By 33 manufacturers who produce for sale, including 5 who also report consumption of own metal. (c) By 15 establishments which manufacture their own metal, including 5 which also produce for sale.

Fitzsimons & Connell Dredge & Dock Co. 10 South LaSalle street, Chicago, has changed its capitalization from $92,000 and 100,000 shares no par value to 100,000 shares no par value.

Oil Tank Orders Boost Steel Plate Demand

Due in large part to orders for steel plates for oil storage tanks, January orders for plates turned upward from the all-time low in department of commerce compilations, which was set in December, 1931. The January total of 17,613 tons compares with 27,518 tons in January, 1931, according to the following:

In Tons

1931	Total	Oil storage tanks	Blast furnaces	Miscellaneous
Jan.	27,518	2,598	111	20,845
Feb.	24,438	3,585	75	16,245
Mar.	31,056	2,538	833	21,697
April	29,916	7,749	25	17,783
May	26,210	2,411	230	20,370
June	22,806	4,679	356	15,817
July	27,261	4,136	51	18,785
Aug.	24,282	1,138	125	18,331
Sept.	33,473	4,024	254	18,692
Oct.	20,839	1,955	200	16,336
Nov.	18,268	1,755	401	15,058
Dec.	16,442	778	86	13,891
Year	302,509	37,346	2,747	213,850
1932				
Jan.	17,613	4,783	129	12,124

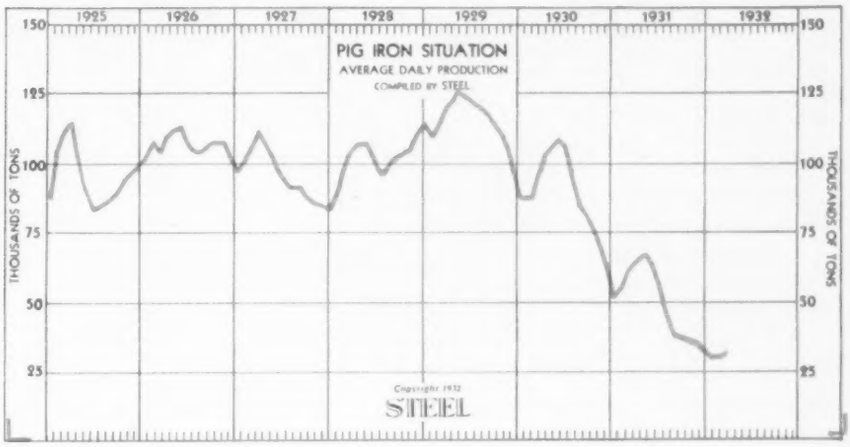
Pittsburgh River Steel Shipments Are Less

River shipments of iron and steel products in the Pittsburgh district declined during January. The movement over the Monongahela river was 25,327 tons, the largest since September, but comparing with 90,405 tons in January, 1931. Ohio river shipments declined from 51,138 tons in December to 45,199 tons in January. This compares with 88,089 tons a year ago. Comparative monthly figures follow:

1931	Allegheny	Monongahela	Ohio
Jan.	50	90,405	88,089
Feb.	.....	58,847	75,264
March	.....	76,137	104,792
April	1,250	57,751	91,570
May	1,330	35,373	59,611
June	500	21,340	46,945
July	717	21,917	39,300
August	5,800	14,522	49,164
Sept.	8,525	25,508	49,269
Oct.	2,705	24,383	49,059
Nov.	5	24,338	42,247
Dec.	.....	21,360	51,138
Year	20,882	471,881	746,448
1932			
Jan.	.....	25,327	45,199

United States Smelting & Refining Co. has closed its Eagle and Blue Bell mines in the Tintic district of Utah because miners refused to accept a cut of 50 cents a day.

	1932	1931
Feb.	33,122	61,114
Jan.	31,336	55,337
	1931	**1930**
Dec.	31,694	53,732
Nov.	36,727	62,128
Oct.	37,831	69,851
Sept.	38,947	75,893

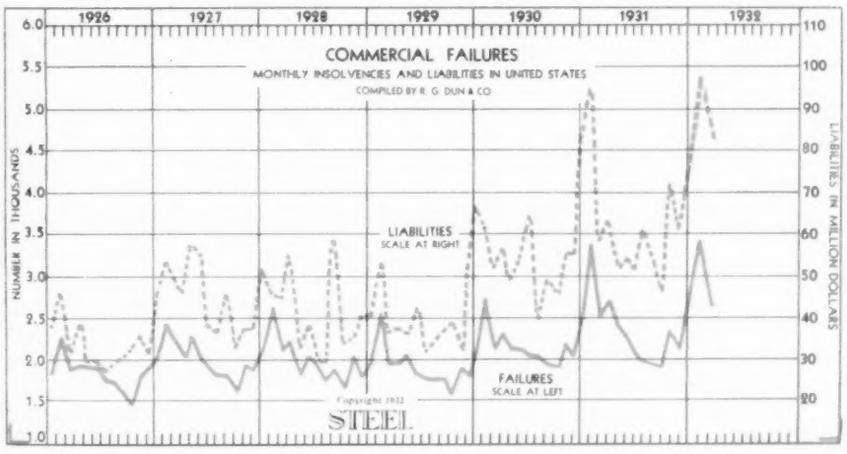


Daily Output of Pig Iron Registers First Gain in Ten Months

With an average daily rate of 33,122 tons, production of coke pig iron in February registered its first increase in 10 months, or since April, 1931. The gain over January was at the rate of 1786 tons per day, or 5.7 per cent. During February three more blast furnaces became active, making a total of seven resuming since the first of the year. Stacks producing iron on the last day of the month numbered 64, compared with 61 on Jan. 31 and 57 on Dec. 31. Relating production to capacity, the rate of operation for February was 23 per cent, compared with 21.8 in January and 22 in December. Total output of iron for the month was 960,550 gross tons, 10,887 tons less than January.

Commercial Failures Decline, But Total Is Record for February

Although the number of commercial failures in the United States for February declined 21.0 per cent from the January total, it established a new level for the second month. According to statistics compiled by R. G. Dun & Co. the number of insolvencies reached a total of 2732 for February which is 6.6 per cent in excess of last year's total of 2563 and 17.2 per cent above the previous maximum which was achieved in 1922 when a total of 2331 failures were reported. Liabilities for February, although declining nearly 12 million dollars from the previous month, still are above the average. The total was $84,900,106, an increase of 42.4 per cent over the $59,607,612 of February, 1931.

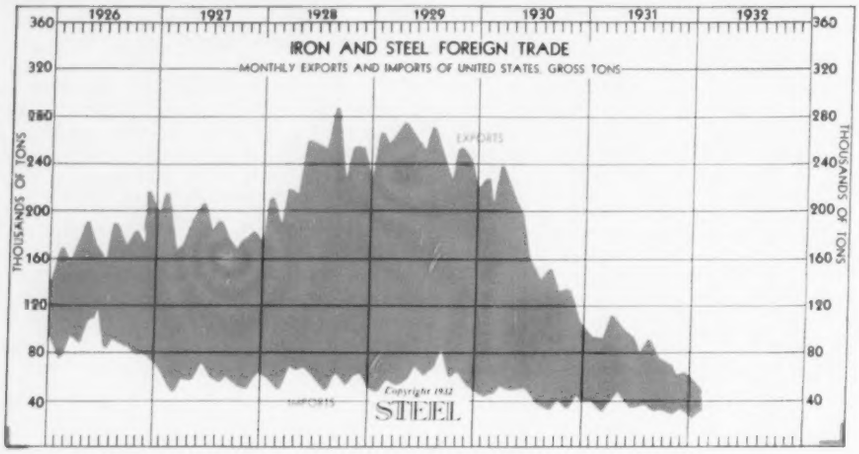


Liabilities

Feb., 1932	$84,900,106
Jan., 1932	96,860,205
Feb., 1931	59,607,612

Number

Feb., 1932	2,732
Jan., 1932	3,458
Feb., 1931	2,563



Exports	Tons
Jan., 1932	40,660
Dec., 1931	57,263
Jan., 1931	92,719
Imports	
Jan., 1932	31,053
Dec., 1931	25,812
Jan., 1931	41,628

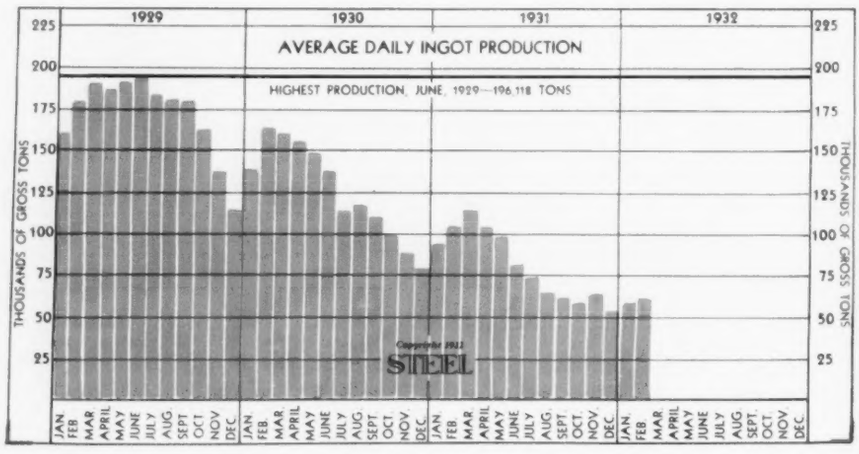
Export Trade Balance of Iron and Steel Reduced in January

With the importing of 10,697 tons of bars and shapes in January from Belgium and 5239 tons of pig iron from Holland, imports of iron and steel products registered an increase from 25,812 tons in December to 31,053 tons in January. Meanwhile, states the department of commerce, exports were declining from 57,263 tons in December to 40,660 tons in January, thereby reducing the trade balance of 31,451 tons in December to 9607 tons for January. During the past six months imports have remained fairly stationary, but exports have been easing off. Thus, for the first time in many years the favorable balance of foreign trade of the United States in iron and steel is threatened.

Steel Ingot Rate Is Up in February; Operations 27.57 Per Cent

Contrary to expectations based upon the weekly estimates of steelmaking operations, the average daily output of steel ingots in February amounted to 58,382 tons, a gain of 2179 over the average for January. Total production for the second month was 1,459,547 tons, a slight drop from the 1,461,290 tons made in January. The calculated operating rate for February was 27.57 per cent of capacity, as compared with 26.54 in the previous month. The output of open-hearth steel gained and that of bessemer steel declined in February. Output for two months in 1932 is 2,920,837 tons, which is only 58 per cent of the production in January and February, 1931.

	1932	1931
Feb.	58,382	104,265
Jan.	56,203	91,063
	1931	**1930**
Dec.	50,092	76,136
Nov.	63,747	88,489
Oct.	58,977	99,724
Sept.	59,523	109,205



Steel Brake Drums Are Lined with Centrifugally Cast Iron

BY EDWARD W. BEACH
and
EDWIN BREMER

PRESSED steel brake drums for automobiles, until recently used almost exclusively because of their ease of fabrication, have certain mechanical limitations. The trend in automobiles has been toward greater weight, power and speed. These developments, coupled with the advent of free wheeling, have imposed increasingly severe demands upon brakes. Under heavy braking pressures and overheating caused by the braking action, the drums are expanded out of round, causing eccentricity, bell-mouthing, barrel-shaping, scoring, etc. With these conditions present the actual braking surface subjected to the shoe pressure is considerably reduced, the result of which is that a portion of the braking action is lost.

To overcome these difficulties D. J. Campbell, president, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., recognizing the suitability of cast iron as a friction surface for brake drums, several years ago began an intensive search for a suitable alloyed cast iron and process of manufacture for brake drums which would be light, dissipate heat of braking friction readily, remain constant in dimensions and free from scoring, have long life and be safe and dependable. His work resulted in development of a pressed steel drum with a lining of cast iron in intimate combination with the steel. This new type of drum has been adopted by several motor car manufacturers and is being marketed by the Motor Wheel Corp., Lansing, Mich., under the name of the Centrifuse brake drum.

Early experimentation showed that even though it were practical to heat the steel drum to a desired temperature and place it in either a dry sand or permanent metal mold, the steel stamping would lose sufficient heat so that when the cast-iron alloy was introduced into the mold it would not unite with the steel. Perforations in the steel shell failed to serve for interlocking purposes. Introduction of nonferrous metal anchors to cause a segregated

THE authors are, respectively, engineering executive, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; and metallurgical editor, The Foundry, Cleveland.

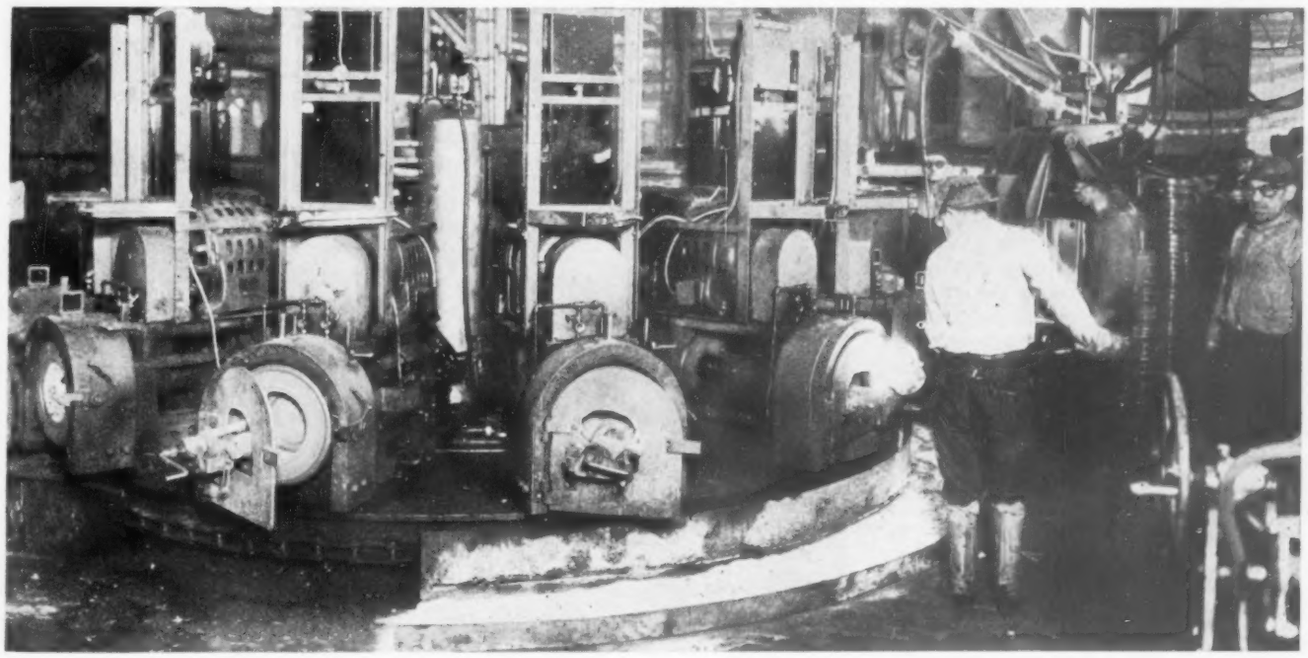


Fig. 1—A view of the pouring machine in action. At the right a pouring basin is being filled with molten iron from hand shanks

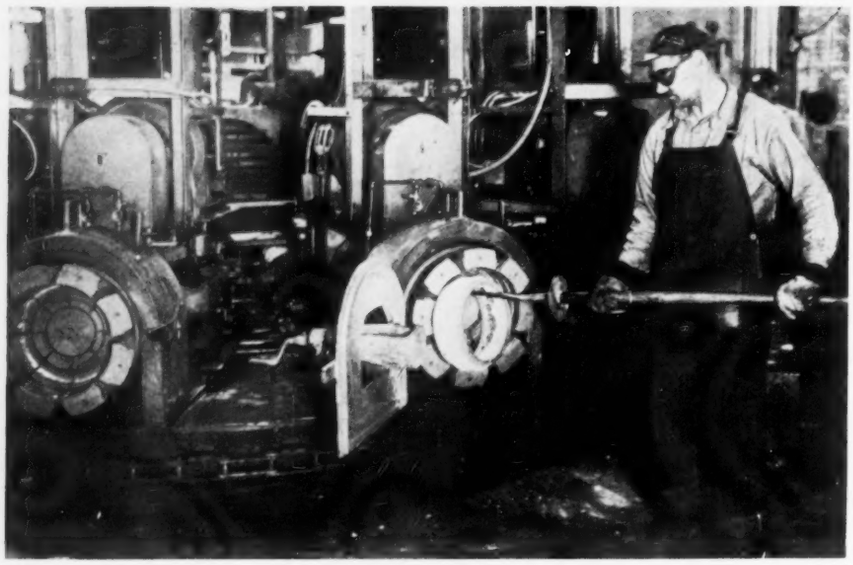


Fig. 2—The incandescent iron-lined drum is removed from the chuck with a special hand tool

brazing was ineffective, and the forming of the steel shell itself into various shapes to serve as a secure holder failed to approach the result sought for—the complete amalgamation of the two elements.

Experiments which led far afield from the direct results desired were conducted until the idea was conceived of spinning the heated steel band at high speed and introducing the molten metal at a temperature which would, in combination with an accurately predetermined temperature of the steel band, accomplish the actual fusing of the elements.

Experimental steel drums of various shapes and weights were fastened to a face plate on a crudely constructed spinning head for the purpose of trying out the idea of amalgamating the two metals by *fusing* in the alloyed lining by centrifugal force in combination with correct temperatures. The results obtained by this radical departure from accepted foundry methods gave promise of successful final results.

Service Tests Made

With the fact established that complete amalgamation could be effected and the elements united in actual fusion, the experimental drums thus made were subjected to the most elaborate and exacting mechanical and physical tests in the laboratory and on the road in actual service both on passenger and commercial vehicles of all sizes, weights and horsepowers. These tests proved, without doubt, the value of this new idea.

With the assurance of the mechanical success of the product from the automotive engineering standpoint, the task of perfecting fast and accurate production methods was undertaken. This required the design of high-speed centrifugal casting machines wherein a double-width steel band (which when cut in the center formed two duplicate, individual brake drum rings) could be *chucked* securely and accurately, and revolved at high speed during the pouring or introduction of the molten cast iron alloy.

Next in importance was the assembly of these individual producing machines into production units and for that purpose the utility of the turntable method was chosen whereby the performance of the same operation by an individual operator could be utilized both for perfecting skill in operation and increasing production.

Space limitations required as compact a casting unit as possible. How this feature was attained is shown in accompanying illustrations. The 12 centrifugal casting machines are mounted radially on a 15-foot diameter turntable which contains all the operating mechanisms, water and oil cooling systems, etc. Views of the tables with the machines are shown in Figs. 1, 2 and 3.

Chain Conveyor Used

The same space limitations made it necessary to construct an elaborate overhead chain conveyor system 450 feet long which is located mainly in the trusses supporting the roof. The production flow sheet is presented in Fig. 4.

The drums, which are electrically welded hooped circles of strip steel, are received at one side of the building in carload lots. They are cleaned on the interior portion only by specially designed sandblast units. The cleaned drums are placed in a special device which gives them an interior coating of fluid flux.

Then they are suspended on chain hooks which carry the drums to the electric induction-type preheaters at the opposite end of the building. An operator on the chain delivery side of the heater removes a drum from the conveyor hook and places it in the preheater. When the desired temperature is attained an operator on

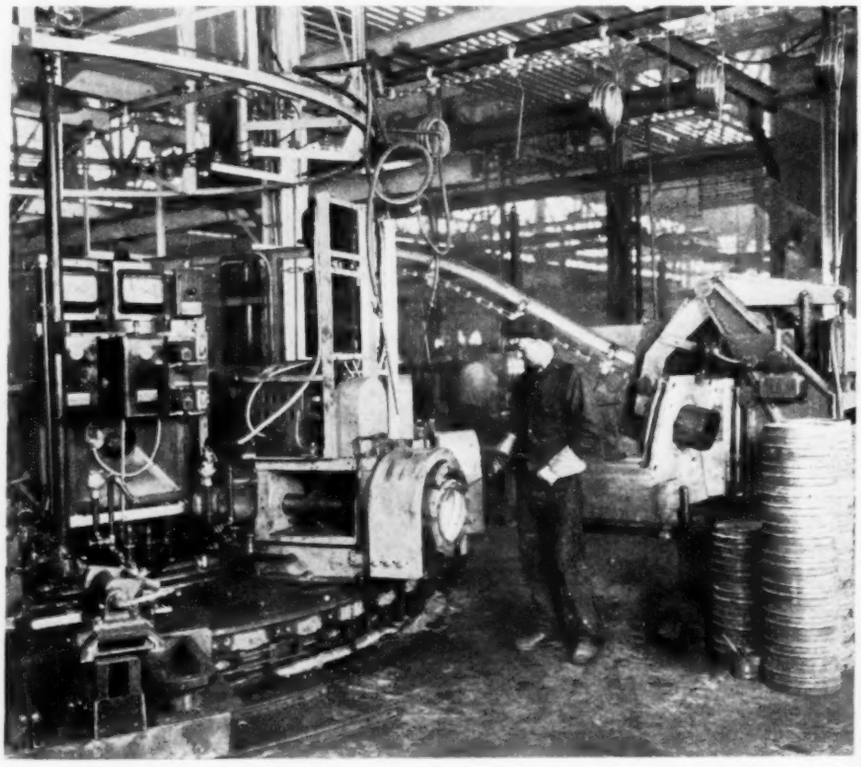


Fig. 3—Placing the preheated incandescent drum in the spinner chuck. Induction heating unit is shown at the right

the opposite side of the heater removes the hot drum, and places it in the chuck of the centrifugal casting machine as shown in Fig. 3.

The safety door containing the pouring ladle is closed after the chuck is locked in the closed position. The rotating mechanism is then started, and the pouring basin which has been filled with molten metal as indicated in Fig. 1 is immediately emptied into the rapidly rotating drum. As soon as the molten metal has solidified, the safety door is opened and the rotation of the chuck stopped. An operator removes the incandescent lined drum with a long fork as shown in Fig. 2 and places it on the lower hook of the conveyor chain for tranportation to the cleaning and shipping departments. .In the cleaning department the drums are sandblasted inside and outside in a machine designed especially by the firm's engineers for that purpose.

The turntable units are provided with space for 12 spinning machines and are approximately 18 feet in diameter overall. In the center of each table the water cooling system pump and radiator, the oil pumps, pressure tank, and oil filter for the hydraulic chuck operation and lubricating system are mounted. Each system has its reservoir tank below the surface of the table.

In addition, two intricate piping systems and the conduits containing the electrical power circuits are placed in the center. The hydraulic system includes sight gages, dial gages, and an electrical pressure regulator which operates a by-pass valve for maximum high pressure and an electrical alarm gong for a minimum pressure, both of which are added as extreme safety measures in connection with the operation of the chucks.

Overhead Trolley

The electrical power is taken from above by trolley and supplies twelve 10-horsepower motors and the operating motors of the oil, water and cooling systems. Drive for the turntable is located below the floor level and has incorporated in it a variable-speed transmission which will permit of varying peripheral speeds from one revolution in 2 minutes to a minimum speed of 6 minutes for a complete cycle. The normal speed at which these tables are operated is one revolution in 3 minutes, or the passing of four chucks per minute past a given machine operation.

The spinning or chucking machines, as may be observed from Figs. 1, 2 and 3, are extremely rugged in design and the spinning heads and shafts are balanced dynamically with the utmost accuracy to eliminate vibration of the chuck spindle, which is mounted on ball bearings. The outer race of the bearings is 12 inches in diameter carrying 2-inch balls, and because of the extreme heat conditions to which these bearings are subjected, they are mounted in water cooled cases and served with forced feed lubrication.

The chuck is of the conical collet type operated hydraulically (oil) in both directions, that is, to open for receiving and ejecting the drum before and after casting, and for holding the drum securely during the initial cooling after the molten metal has been introduced. During this period of cooling, the chuck must be held from opening against centrifugal force, notwithstanding that a safety lock is also provided to prevent operation of the control valve during this period.

The spinning machines are self contained to facilitate their handling on and off the turntable units. This is accomplished by the breaking of six pipe unions, the pulling of one electrical plug and the removal of six

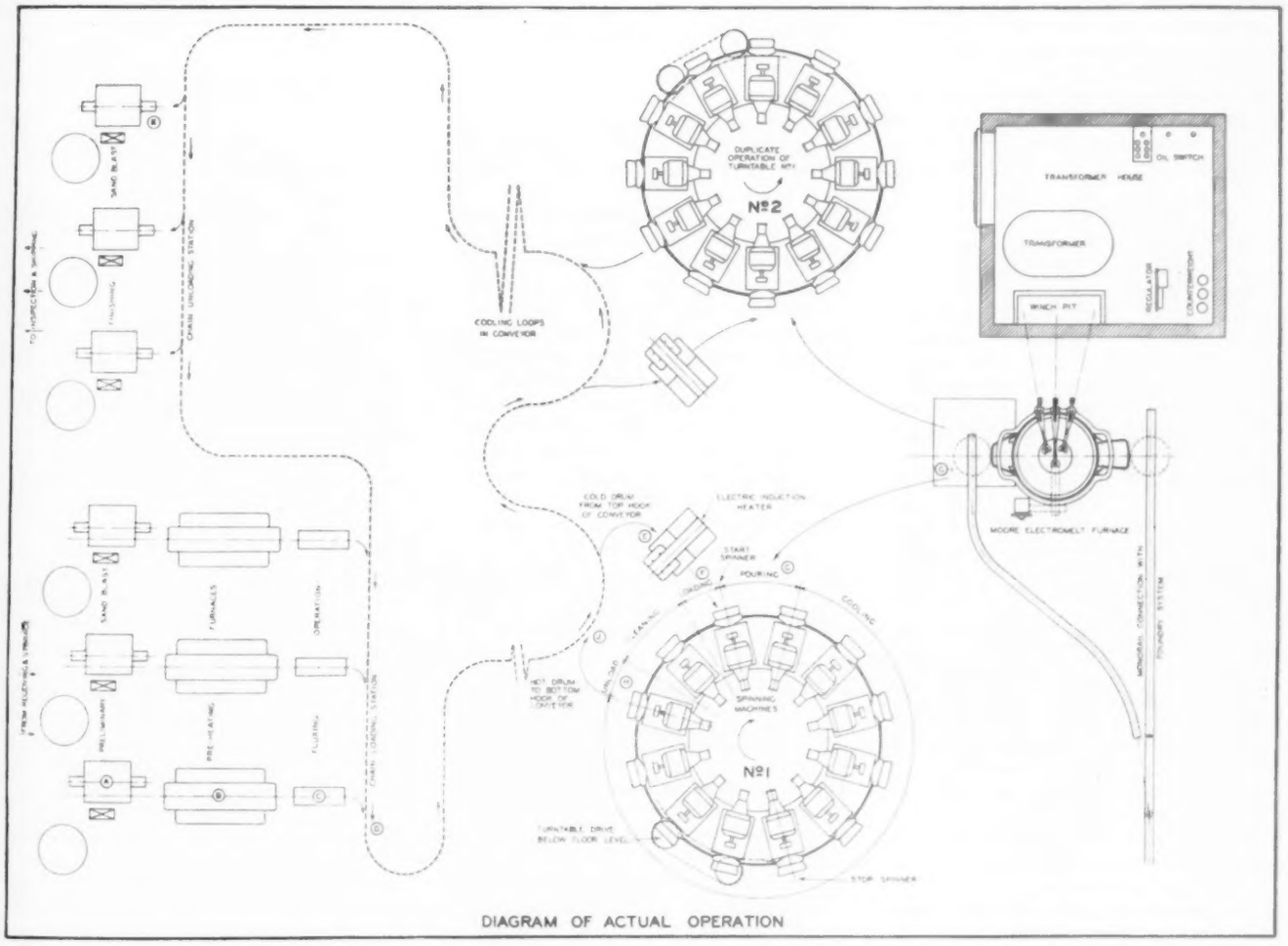


Fig. 4—Steel drums enter at lower left, follow along conveyor (dotted line) through pouring and spinning operations, and leave system at upper left

holding-down bolts; a special lift truck skid with a roller conveyor top of the same height as the turntable surface has been provided to facilitate the handling of casting machines.

A summary of this process was presented on page 40 of the Feb. 1 issue of STEEL, while a description of a machine developed to split the drums after the foundry operations was given on page 44 of the same issue of STEEL.

New Corrosion-Resisting Steel Contains Chromium, Copper and Silicon

CULMINATING eight years of research, experimentation and development, on the part of the Ludlum Steel Co., Watervliet, N. Y., the Associated Alloy Steel Co., Cleveland, announces a new patented corrosion-resisting alloy steel known as Nevastain RA. The steel is of a straight-chromium type, containing copper and silicon and is claimed to offer many economic and fabricating advantages. The material was developed as a result of research aimed to perfect a corrosion-resisting steel which could be mill processed and handled by the fabricator with the same tools, furnaces and heat treatments that are general practice for mild steel.

Maximum carbon content is 0.10 per cent; maximum phosphorus and sulphur contents are 0.030 per cent. Other elements are present in approximately the following proportions: Manganese, 0.40; chromium, 16; silicon, 1; and copper, 1 per cent.

Does Not Work Harden

The new material is magnetic and does not work harden to the same extent as other stainless alloys, it is said, and therefore can be cold rolled, drawn, upset and formed with facility. High-temperature heat treatment for annealing or to relieve forging or drawing strains is not required, full ductility being obtained at normal annealing temperatures (1500 degrees Fahr.). However, when required, higher strength and hardness can be obtained by heat treatment, in which the steel is heated uniformly to 1700-1750 degrees Fahr., quenched in water or oil, and then drawn to requirements, generally 1000-1200 degrees Fahr.

The steel machines almost as easily as the high-sulphur types of corrosion-resistant alloys, and can be sheared, punched, perforated, sawed and drilled by ordinary methods. It can be gas or electric arc, flash or spot welded without tendency toward grain growth. A high permanent luster of a blue-white color is obtainable by polishing.

Annealed Nevastain RA bar stock shows ultimate strength of 75,000-90,000 pounds per square inch; yield point of 40,000-50,000 pounds per square inch; elongation in 2 inches of 30-40 per cent; reduction of area of 60-71 per cent; brinell hardness of 150-170; and Rockwell B hardness of 80-90.

Applications are essentially the same as for other types of corrosion resisting steel, including such items as automobile trim, architectural work, airplane parts, cooking utensils, conveyors, decorative work, elevator cabs, exterior building trim, hotel equipment, kitchen equipment, marine hardware, ornamental work, pilaster trim, radiator shells, etc.

Lists Supply Sources for Nickel Steel Products

International Nickel Co. Inc., 67 Wall street, New York, has issued its 1932 buyers' guide for nickel alloy steel products. The publication is designed as a convenient and reliable tabulation of sources of supply for nickel steels and special ferronickel alloys. It does not include nickel cast iron or any of the nonferrous nickel-bearing alloys. The 20-page pamphlet is divided into five sections, presenting manufacturers, fabricators and distributors of (1) structural grades, or 1 to 5 per cent nickel steels, (2) corrosion-resistant steels of the chrome-nickel austenitic type, (3) heat-resistant chrome-nickel-iron alloys, (4) special ferronickel alloys, and (5) special services.

Wire Association To Meet With Metal Congress

The wire industry will have an important share in the 1932 National Metal congress and exposition in Buffalo, Oct. 3-10, W. H. Eisenman, secretary of the American Society for Steel Treating and director of the exposition, has announced. The Wire association will have a series of meetings as part of the congress, while a number of manufacturers of wire and wire drawing equipment have reserved space in the National Metal exposition.

In addition to the Wire association, the following technical societies will cooperate in the congress: American Welding society; the Insitute of Metals and the Iron and Steel Divisions of the American Institute of Mining and Metallurgical Engineers; the Iron and Steel Division of the American Society of Mechanical Engineers; and the Production Activity Division of the Society of Automotive Engineers.

Reservations for exhibit space already cover almost half of the available 50,000 square feet.

Sheet Mill Practice Is Theme of Symposium

Program has been announced for the symposium on mechanical, combustion and electrical developments in the iron and steel industry, to be held March 24 at the Ohio hotel, Youngstown, O., by the combustion engineering division of the Association of Iron and Steel Electrical Engineers. Seven technical discussions are to be presented, as follows:

"Improvements in Methods of Wet Cleaning of Gases," by Robert R. Harmon, Peabody Engineering Co., New York.

"The Uses of Natural Gas in Steel Plants with Special Reference to Tests Using Gas to Atomize Fuel Oil," by Carl Emmerling, East Ohio Gas Co., Cleveland.

"The Combination System," by R. J. Wean, Wean Engineering Co., Warren, O.

"The Combination Method," by H. E. Melin, Aetna-Standard Engineering Co., Youngstown, O.

"Continuous Heating Furnaces," by H. P. McCann, McCann-Harrison Co., Cleveland.

"Continuous Heating Furnaces," by A. L. Hollinger, Surface Combustion Corp., Toledo, O.

"The Application of Motors and Controllers to the Combination System and Combination Method," by J. J. Mellon, Clark Controller Co., Cleveland; G. A. Caldwell, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; E. W. Henderson, Reliance Electric & Engineering Co., Cleveland; and W. B. Snyder, General Electric Co., Schenectady, N. Y.

Installs X-Ray Equipment

What is said to be the first commercial X-ray machine installed in a shipyard recently has been erected in the plant of the Sun Shipbuilding & Dry Dock Co., Chester, Pa., under supervision of the St. John X-Ray Service Corp., New York. The equipment is designed primarily to meet the requirements of the A. S. M. E. boiler code for welded pressure vessels, although it is flexible enough to be used on other types of welded construction, as well as for the examination of castings and forgings. The shipbuilding company also will provide inspection service for work outside its own plant.

MAKING THE MOST OF STEEL

CRYSTAL japans in various colors are being applied to metal caskets, optical goods, radio parts, scales, instruments, store fixtures, etc. The coated material is charged in an oven maintained at 100 degrees Fahr. for 45 minutes during which time the air intake valves are kept closed. Then the vents are opened and the temperature raised to 350 degrees for 30 minutes. The crystals are formed in the 45-minute period. An open-flame gas oven is preferred. Absence of oxygen and presence of sulphur (from the gas) aid in forming the desired crystal effect.

A MICHIGAN foundry has perfected a process for casting centrifugally gray iron linings in pressed steel brake drums for automobiles. The use of centrifugal force in combination with correct temperatures of the preheated drums and the molten metal causes complete amalgamation of the shells and linings. This new development, which probably can be extended to important applications other than brake drums, is explained in greater detail on page 31 of this issue.

♦ ♦ ♦

Embrittlement of galvanized structural steel, particularly members of transmission towers, is the subject of comprehensive studies by two research organizations (STEEL, page 35, March 7, 1932). Preliminary investigation indicates failure is more likely to result from improper cold punching of rivet holes than from the pickling or galvanizing operations. Indicated remedies are drilling, or subpunching and reaming large-sized angles.

♦ ♦ ♦

Among the recent applications of 18-8 chromium-nickel steel is the use of this alloy for metal adjusting screws for steam flow condensation meters in district heating systems. Experiments made in a central steam plant in the East show that pounding which breaks down other metals increases the tensile strength of the 18-8 steel.

♦ ♦ ♦

Experiments with "free-cutting," corrosion-resisting steel composed of 0.12 per cent maximum carbon, 11.5 to 14.0 chromium, 0.25 molybdenum, 0.5 manganese, 0.50 silicon, 0.025 phosphorus and 0.40 to 0.50 sulphur show that forging can be done successfully at temperatures from 2100 to 2200 degrees Fahr. Following a carefully controlled anneal, the forgings (golf club heads) are cold trimmed at 1600 degrees Fahr., after which they are cooled slowly. This method is economical due to the increased production when cold trimming and to the fact the anneal is not an extra operation, it being required for machining.

♦ ♦ ♦

By a recently developed fusion process, lead coatings can be applied to steel parts of pumps, mixers, agitators, fans, blowers, water wheels, etc., exposed to corrosive liquids or fumes. The process is suitable for coating revolving parts that have small clearances.

A MANUFACTURER desired to fabricate a shallow vessel of 18-8 chrome-nickel steel by soldering a seam on the inside and reinforcing it by a weld on the outside. With the weld made, it left a hard oxide deposit to which solder would not adhere. If the seam were soldered first, the heat required for welding would melt it. The problem was solved by the simple expedient of soldering the seam inside, partly filling the vessel with water and welding the seam on the outside. The water served to absorb the intense heat sufficiently to preserve the solder.

♦ ♦ ♦

It has been found that plating steel measuring tape with chromium to cover the gage marks not only prolongs the visibility of the markings but also minimizes the occurrence of scratches which often are confused with gage marks.

Another Debut!

STEEL is man's most valuable and versatile metal. Processed, fabricated and used intelligently it serves civilization in manifold ways. This department is inaugurated by STEEL to acquaint readers with the latest developments in heat treating, forming, fabricating, finishing and other operations involved in getting the most out of the many wonderful inherent properties of this master material.

—THE EDITORS

Forge Furnaces Improved by Diffusion Combustion

BY H. M. HEYN

Heat Treating Engineer, Surface Combustion Corp., Toledo, O.

DEFINITE advancements in the design and combustion principles employed in forge furnaces have been made in the past year, until now it may be said safely that many of the inherent disadvantages of present-day forge furnace practice have been minimized, largely by the application of diffusion combustion to the gas-fired forge. Heating steel for forging presents two definite requirements — quick, uniform heating to temperature, and a minimum of damage to the steel, either to its surface or internal structure. The latter involves control of furnace atmosphere and with the advance of the process of diffusion combustion, properly applied to a forge furnace, it is possible to maintain control of atmosphere within the furnace.

Oxidation or scaling generally is accepted as a necessary evil throughout the forging industry and no really consistent effort ever has been made to overcome or minimize it. The fuel most commonly used and the limited combustion space of the present forge furnaces result in incomplete combustion. In such furnaces excess oxygen and unburned gases sweep over the steel, the one tending to scale and the other to protect it. Despite attempts to maintain a so-called smoky flame, steel heated in a furnace of this type usually is scaled heavily. In the case of slot forge furnaces this condition is aggravated even further by the intrusion of outside air through the slots.

The amount of scale scraped off the steel before placing it in the die may result in reducing the cross section to a point where it will not fill the die cavity. It is practice, therefore, to provide excessive amounts of steel, which results in the production of flash which must be trimmed off and scrapped after the forging operation.

Some Scale Adherent

Scale formed with most steel is comparatively free and friable, and is removed readily. However, some grades of steel, especially in the alloy class, develop an adherent scale that is difficult to remove and is hammered into the forging with subsequent spoilage. The abrasive action of scale, of course, shortens the life of the die, thus creating another source of difficulty. In instances where steel is shaped in a press, scale is even more undesirable. Unless it is removed entirely the squeezing action of the press imbeds the scale in the steel.

A strongly decarburizing atmosphere exists in most forging furnaces. If decarburization is comparatively light subsequent machining of the steel will remove it; however, deep decarburizing may impair the strength of the part. Overheating and burning affect the internal structure of the steel to such an extent that it cannot be restored to a normal state, even by subsequent heat treating. Effects of burning do not appear on the surface, so that forgings apparently sound, even after hardening, machining and finishing, will prove defective in service if burned in heating.

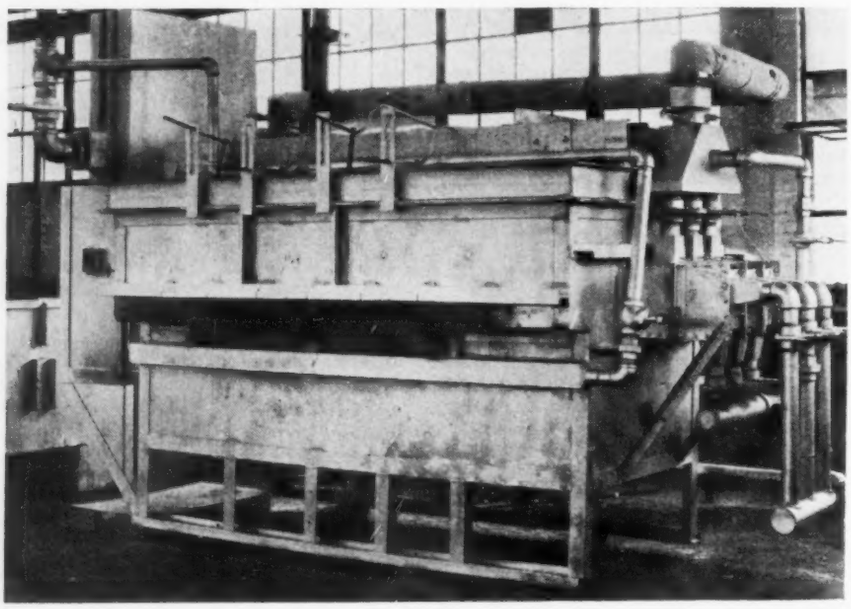
Solution to most of the foregoing difficulties rests with control of furnace temperatures and atmospheres. Although temperature control is not unknown in the forging industry, it has not been given general recognition. One factor which stands in the way of its acceptance is that it is difficult to determine a point of control in the furnace. The whole furnace chamber is filled largely with flame, and a thermocouple is more responsive to the direct action of this flame than to the temperature of the work itself. Furnaces with enlarged combustion chambers and multiple thermocouples solve this difficulty, although such furnaces have not been developed extensively because the pressure within the furnace chamber is reduced, allowing greater seepage of air and accelerated scaling of the steel.

Segregate Gas and Air

Until recently no efforts were made to control the atmosphere of the forging furnace, except to the extent of maintaining a smoky flame. A step in this direction is diffusion combustion, by which gas and air are maintained in separate and distinct layers, and combustion proceeds only at the flame boundaries. No actual mixing of the gas and air takes place except at these boundaries. By segregating the lowermost layer of gas, causing it to sweep over the work resting on the hearth, it is possible to blanket the work completely from the effects of the superimposed layers of air and products of combustion. Correct ratios of carbon monoxide to carbon dioxide can be maintained and conditions produced where, in the elevated temperatures of forging, the steel itself can be treated without oxidation. A new forging furnace designed by the Surface Combustion Corp., Toledo, O., and utilizing the process of diffusion combustion, is shown in the illustration at the left.

Steel heated in this type of furnace emerges free from oxide, but will oxidize rapidly when exposed to the air in the process of shaping. The scale so formed, however, is light and peels off readily. The total amount of scale formed has been reduced considerably and because of its thinness, the abrasive effect on the die is reduced greatly.

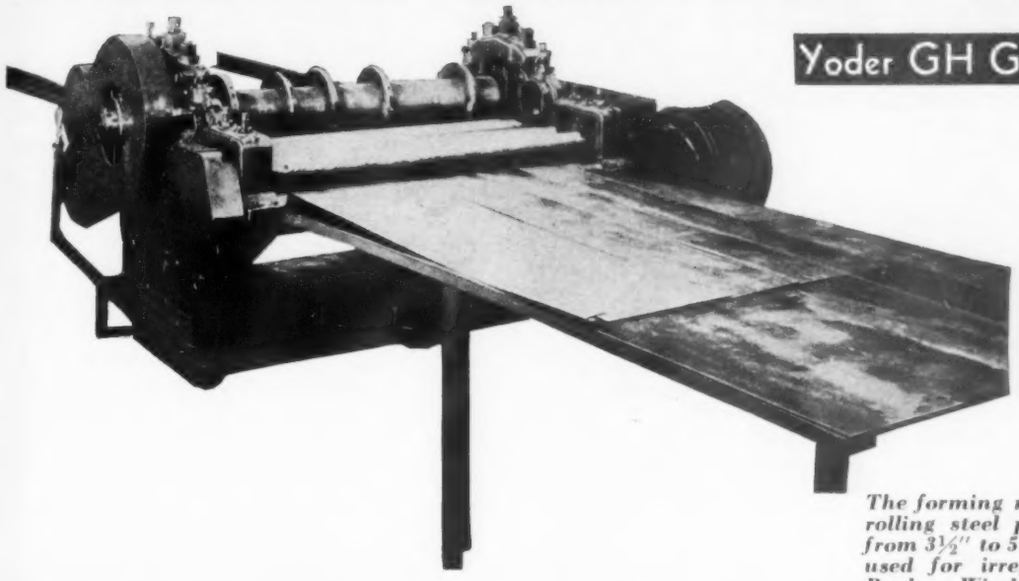
In addition to furnishing atmospheric protection to the steel, the diffusion method also possesses other val-



Recently constructed gas-fired forge furnace employing diffusion combustion principle, minimizing scaling of the steel as it is heated

PLATE AND SHEET WORKING MACHINES

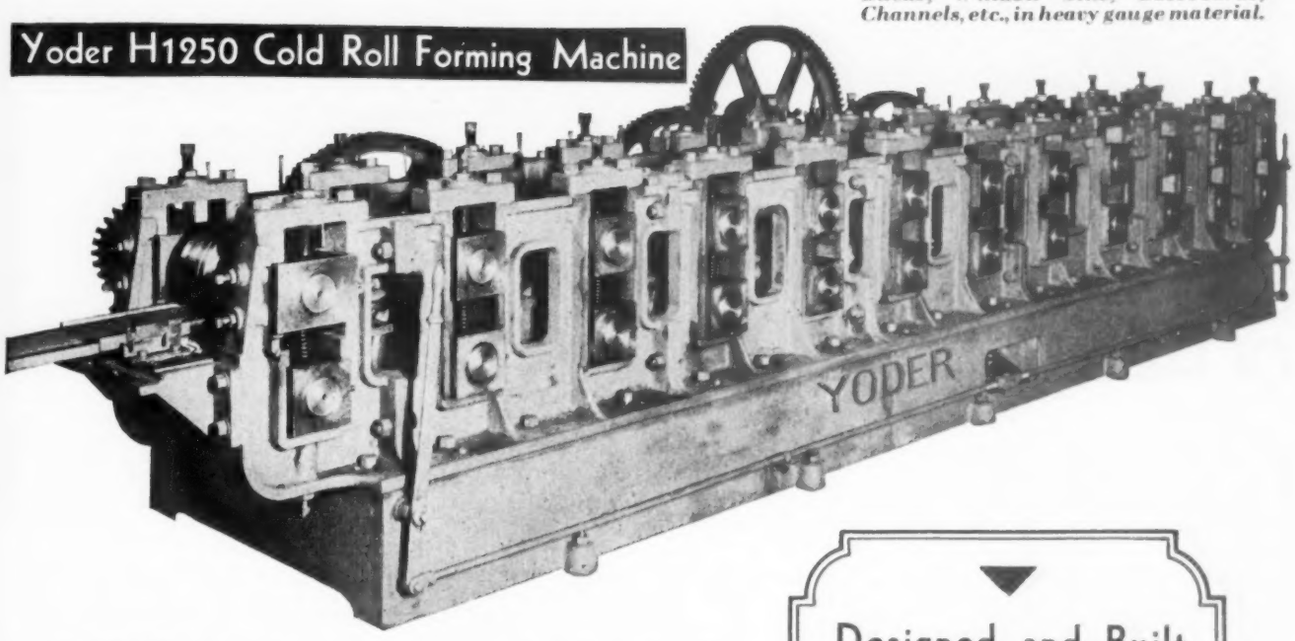
Yoder GH Gang Slitting Shear



Made in sizes from 24" to 72". Capacity of 48" Shear 7 cuts ¼" or 4 cuts ⅜" steel. Capacity 72" Shear, 2 cuts ⅜" steel.

The forming machine is designed for rolling steel pipe of standard sizes from 3½" to 5" both inclusive. Also used for irregular shapes such as Bucks, Window Sills, Baseboards, Channels, etc., in heavy gauge material.

Yoder H1250 Cold Roll Forming Machine



YODER pipe forming equipment handles all sizes from ⅛ inch to 36 inches diameter, and wall thickness from tin plate to ¾ inch. The GIANT PIPE MACHINE has a capacity for forming 100 feet of 30 inch pipe—¾ inch wall thickness—per minute, and produces seams suitable for welding.

Yoder mills are backed by over 20 years experience in developing Cold Roll Forming Machines.

Designed and Built by YODER

Builders of

Gang Slitting Shears
Rotary Shears
Automobile Sheet Metal Forming Machines
Pipe Forming Machines

Consult our engineers on your sheet or plate problems

THE YODER COMPANY
W. 55 ST. and WALWORTH AVE. CLEVELAND, OHIO
PLATE AND SHEET METAL MACHINERY SPECIALISTS

uable characteristics. Hydrocarbons of the fuel gas are heated quickly to high temperature in the absence of the necessary air for combustion, resulting in the liberation of large amounts of fine particles of carbon which float in the flame and absorb heat from that part of the gas which is actually burning. Thus these particles of carbon become intensely hot and in turn radiate their heat back into the work, making possible the generation of heat in the most desirable form for high temperature operation, mainly in the form of radiant heat. Rapid heating rates result, with corresponding increase in production as well as a reduction in the size of the furnace required to heat a given amount of steel. This progressive burning of the fuel also results in a long flame, surprisingly uniform in its intensity throughout its length. Thus a uniform temperature distribution in the furnace is obtained.

Uniform radiation offers the advantage of temperature control from any selected point in the furnace. In order to accomplish this, the thermocouple must be placed on the hearth parallel to the work, so that it will be affected by the temperature of the work immediately adjoining.

In-and-out type furnaces often require more than one thermocouple registering in series on the fuel output, the number of which will be dictated by the operator's judgment. A true indication of the work and temperature can be obtained by this method. Also it is possible, without manual operation of the furnace, to heat steel under production with the perfect assurance of overcoming the dangers of overheating and burning.

It should be emphasized that correct furnaces must be designed to interpret the fuel and operation. These new developments in forging cannot be realized by the simple application of burners to any kind of existing equipment. To realize full benefits of these developments, it is necessary to design the furnace carefully with due regard for all the factors involved. Much time and expense has been involved in working out these constructions, and in selection of refractories capable of withstanding without constant repair the severe conditions of the forging furnace.

It only remains for a means to expedite the hot forming operation in the forge shop, so as to reduce the time of exposure of the hot steel from the time it leaves the furnace until it is formed completely. This is a mechanical operation, the improvement of which is best left to those capable of accomplishing it.

Tests Measure Corrosion Efficiency Of Metal Airplane Coatings

IN AN effort to overcome corrosion of metals used in airplane construction, experiments are being conducted in which parts of these metals with various coatings are exposed to salt spray tests. In preparing a paper on this subject for the American Chemical society, J. L. McCloud, engineering laboratory, Ford Motor Co., Dearborn, Mich., states that the metal airplane has brought a new problem in protecting metal surfaces.

Metal airplanes, he says, are constructed largely of alloys with some use of mixed construction, as of steel and aluminum alloys. Choice of these metals is governed largely by what may be called form, that is, if the member must be of a certain strength and is large enough to have inherent stiffness, it may be of steel, otherwise it will be of aluminum alloys.

Strong aluminum alloys have weight-strength ratios equal to heat-treated alloy steels and have excellent stiffness. With such materials and having in mind that with equal weight that part is stiffest which has the greatest surface, then corrosion prevention becomes paramount. Not only does design demand such a distribution of metal, but safety demands that it shall not be lost in service.

Before finding means for preventing corrosion, engineers must study the nature and degree of corrosion by subjecting the materials to the most severe conditions ever to be encountered. Corrosion in metals starts from the surface and in a structure that is largely surface, it must be prevented from starting.

Intercrystalline Corrosion

Another reason for this surface importance is the type of corrosion in light metal alloys, namely, intercrystalline. Steel, in contrast, is affected mostly by pitting of the surface, but the light alloys become corroded along their grain boundries without of necessity being pitted. This makes it generally much more difficult to detect by observation and the effect may be quite pronounced without being appreciably visible.

Considering the effect of corrosion on the two types of metal, that on steel is to lower its tensile strength and that on light alloys to lower its elongation or extensibility.

In one test, a study of protective coatings over light metals, bars of thin duralumin were exposed to corrosive conditions, according to Mr. McCloud. The test pieces were coated as desired and then tied together with cord in groups with ½-inch wooden spacers between them. These packages were placed in a salt spray box so that they were in a horizontal position and edgewise. This produced uniform corroding conditions.

Kept in Salt Fog

The salt spray box was so arranged that the test pieces were continuously surrounded by a fog of spray from 20 per cent sodium chloride bath, air blown into the box through a nozzle producing this condition. As the pieces deteriorated in the corrosive atmosphere, repeated numbers of them were retested for the same tensile properties and these properties were plotted against time.

This experiment enabled the chemists to determine the protection value of the various coatings as well as the requirements of these coatings from the consumers' point of view. The research indicated that for an airplane constructed of duralumin and in the usual service over land, no protection is necessary except for the skin. For sea and coastal service, however, protection becomes a necessity in direct proportion to the exposure of the ship to salt air and spray.

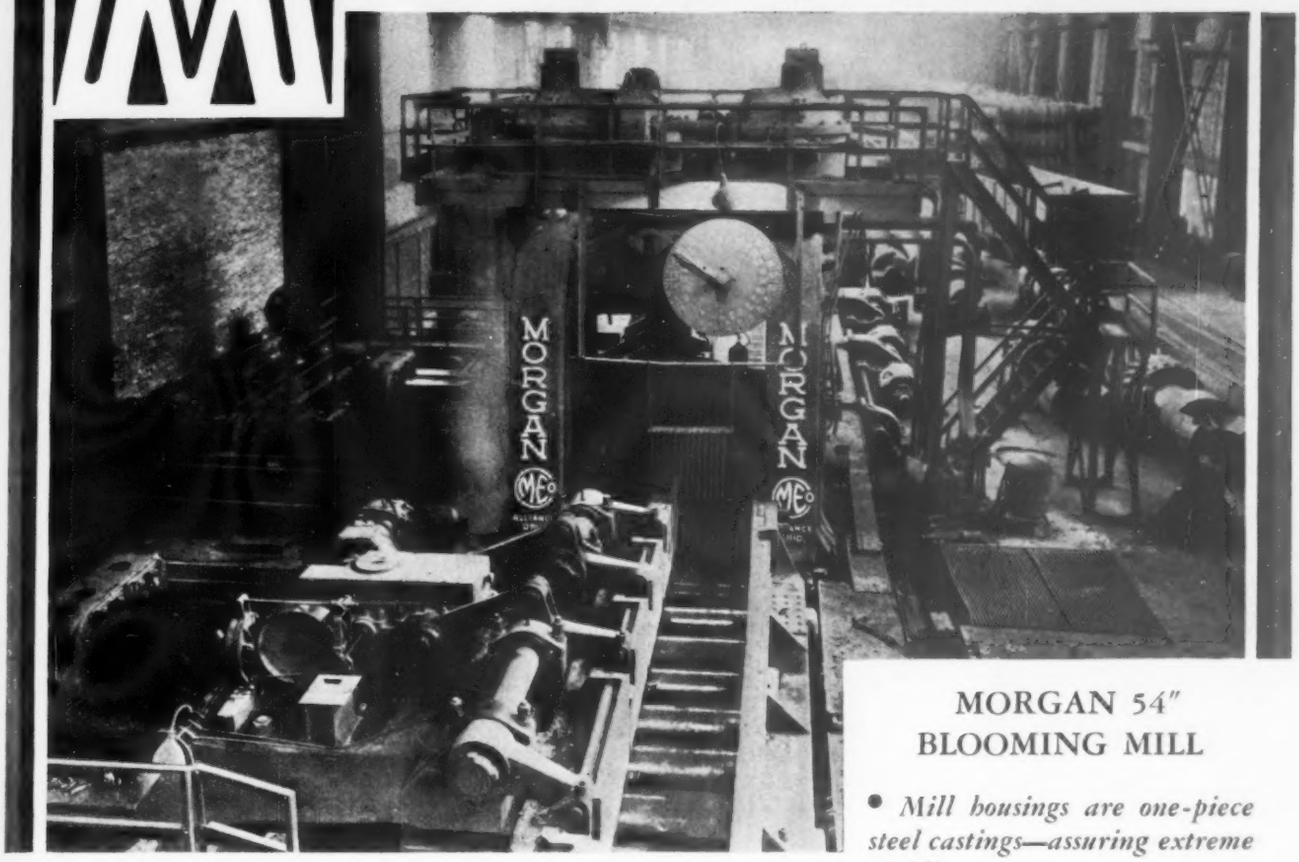
Requirements from the consumers' viewpoint are the actual protection of the metal from corrosion, measured not only by the visual defects in the coated metal, but by the physical property of the coated and exposed metal pieces of an alloy that may be corroded; adherence of the coating with maximum elasticity and surface appearance and its retention.

Pacific Coast Building Is All Arc Welded

The first all arc welded steel structure of its kind in Southern California is in the final stages of erection in Los Angeles by the Soule Steel Co. of that city, for the Pacific Freight Lines. Structural steel to the extent of 100 tons entered into the construction of the building, overall dimensions of which are 290 x 80 feet. With a crew of 10 men working on the job, the time required to erect the steel was 21 days. Arc welding equipment was supplied by the General Electric Co.

In addition to the elimination of disturbing noise, the welding is said to have effected a savings of 10 to 15 per cent over other methods. An outstanding feature of the structure is a 30-foot overhang for sheltering trucks at the loading platform.

MORGAN



MORGAN 54"
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- *Mill housings are one-piece steel castings—assuring extreme rigidity.*
- *Two cylinder roll balance is used, thus requiring minimum head room.*
- *Manipulator is of the overhead type, compact and simple. Finger lifts and side guards are each operated by two motors in series—assuring very quick acceleration and greater tonnage. Write for Bulletin No. 16.*

STEEL PLANT EQUIPMENT

This is a typical example of MORGAN modern design and construction and illustrates the ability of this organization to adequately serve steel plant requirements, as it has done for the past 63 years.

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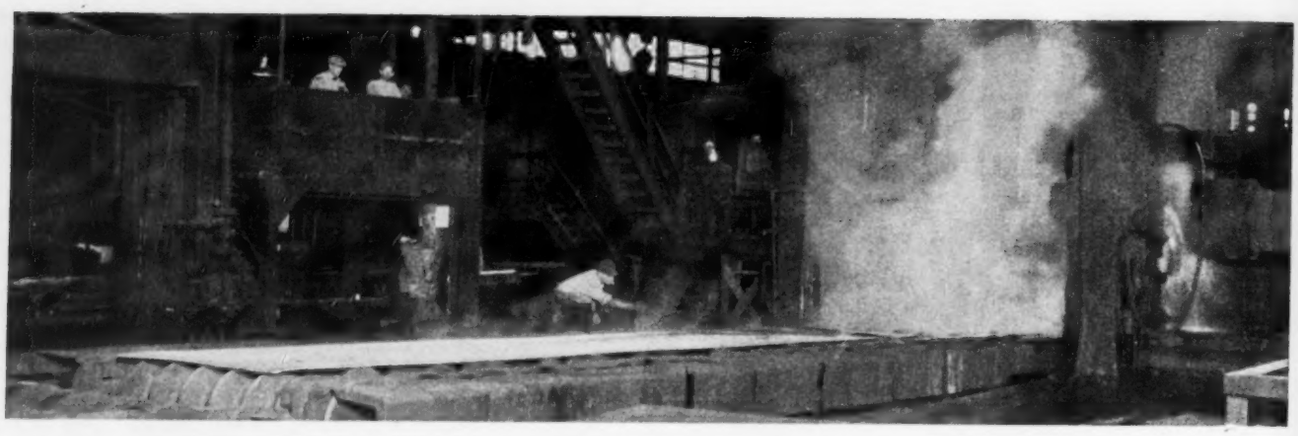
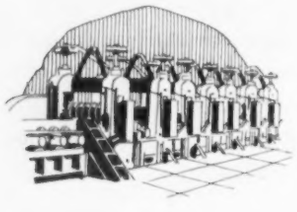


PROGRESS IN STEELMAKING

CLEANING the surface of steel pipe preparatory to the application of a rust-proof coating is accomplished at a western plant by a recently devised method. As the stock rotates during its progression through a pressure-cleaning cabinet, metallic grit abrasive material is directed against its exterior surface by four blast nozzles located at both the entrance and exit ends of the cabinet. Approximately 1 mile of 26-inch diameter pipe in 30-foot lengths is cleaned by the unit in 24 hours.

♦ ♦ ♦

Applying a mixture of graphite and water to ingot molds by dipping three in a tank simultaneously affords a minimum saving in manufacturing costs of finished product of 60 cents a ton, according to records of a large independent steelmaker. The coating to a large extent is instrumental in facilitating stripping, in eliminating flaws and seams in the rolled product, and in reducing chipping costs.



BEARINGS made of laminations of fabric bonded together with synthetic resin are being used on roll necks with great success. Last May a Western steel company installed such bearings on a 10-inch merchant bar mill and they still are in good condition. Bearings of a different type formerly used on this mill averaged seven rolling turns. Laminated fabric bearings have been installed on a continuous sheet bar mill in Northern Ohio and already have given more than twice the life of bearings formerly used. While some grease is used, the principle lubricant is water. Continuous cooling is necessary for the reason that the material softens at high temperature. With these bearings fewer adjustments of the rolls are necessary, a greater reduction per pass is possible and less power is required for the same reduction of section. In one case power consumption was decreased approximately 25 per cent.

OTHER factors being equal, the life of an ingot mold is influenced largely by its shape, according to comments of a manufacturer. Molds of plain round contour have the longest life; fluted round molds follow in order; square, near square and slab molds rank next; those of extreme slab sizes give the shortest usage; plain wall molds usually give longer service than fluted or rippled shapes; and, bottom poured molds stay in service longer than the same molds top poured.

♦ ♦ ♦

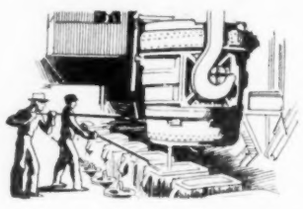
Chrome-nickel wire of the 18-8 type in sizes ranging from 0.060 to 0.015-inch with a tensile strength of about 250,000 pounds a square inch now is being fabricated into wire rope by one producer. The cost is about five times that of the best carbon steel wire rope.

♦ ♦ ♦

Mechanical handling of hot strip by speedy retirement of coiled stock to the warehouse, is accomplished by a new method followed by a mill in the Pittsburgh district. Strip from specially designed coilers is received by a loading platform at floor level, which when tilted, deposits the coil on a projecting arm of a carrier. Air-operated dogs then slide the bundles to the extreme end of the arm. When filled to capacity, the arm assumes a vertical position, thus permitting the crane to remove the bundles while an alternating arm is being loaded.

♦ ♦ ♦

Waste heat in the gases exhausted from a bank of stoves serving a southern blast furnace is employed for increasing the temperature of the cold blast before it enters the stove connected with the furnace. The recuperator consists of a long chamber built of brick and lined with insulating material. Within this chamber 12-inch cast-iron pipe placed in a vertical position and connected by U-bends form eight or more parallel lines of 30 lengths each. The hot gases from the flues are admitted to one end of the recuperator, circulate around the coils and emerge at the other end into the chimney. The heat energy salvaged and returned to useful work averages about 400 degrees Fahr. The heat taken up by the cold blast passing through the recuperator amounts to about 270 degrees Fahr.

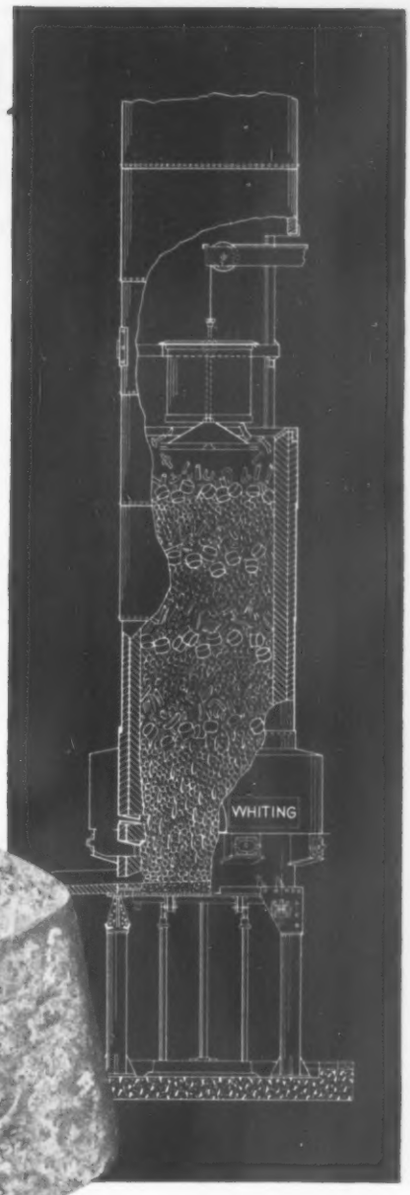


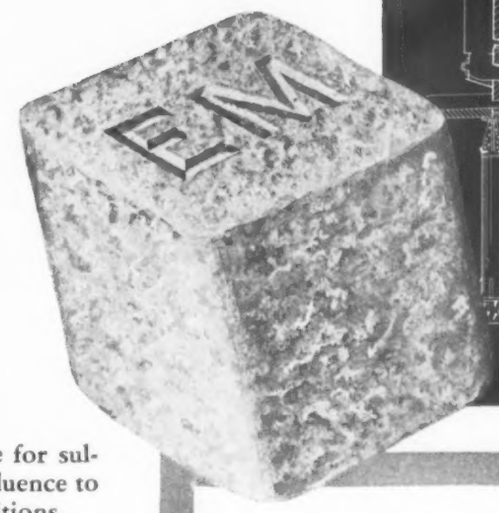
NUMEROUS open-hearth shops now are using ladle nozzles 12 inches and longer with holes other than round as a means of preventing the steel spashing the mold walls during the pouring operation.

♦ ♦ ♦

A new silica brick, developed by a refractory maker in this country, is giving satisfactory service on an open-hearth furnace roof, showing approximately 25 per cent better life.

E. M. MANGANESE BRIQUETS FOR Desulphurizing IRON IN THE CUPOLA





MANGANESE as a desulphurizer is most effective if no contamination or oxidation can occur before it meets the molten iron in the cupola hearth.

Maximum desulphurization with manganese is assured through the use of E. M. MANGANESE BRIQUETS because the alloy is held in a refractory binder which protects it from oxidation and loss. No melting takes place until the briquet reaches the hottest zone of the cupola.

Each E. M. MANGANESE BRIQUET contains 2 lbs. of metallic manganese, ½ lb. of metallic silicon and less than .06 lb. of carbon. The presence of silicon and absence of carbon increase the affinity of manganese for sulphur. The silicon also exerts a softening influence to be taken into account when calculating additions.

Desulphurization of the iron and a high recovery of manganese are only two of the many advantages E. M. MANGANESE BRIQUETS bring to the foundry. Electromet Engineers will gladly furnish additional information. Write today for details.

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Unit of Union Carbide and Carbon Corporation
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Electromet
Ferro-Alloys & Metals

A REFRACTORY binder protects the alloy content of E. M. BRIQUETS from premature oxidation. At the hottest zone of the cupola, the binder disintegrates and releases the full charge of the uncontaminated element to the iron. Recovery is higher. Thorough solution is assured. Guesswork and waste are eliminated.

Electromet Ferro-Alloys now available in briquet form include

E. M. SILICON BRIQUETS (round)
E. M. CHROMIUM BRIQUETS (hexagonal)
E. M. MANGANESE BRIQUETS (square)

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

High-Speed Steel

Obtaining better results in hardening high-speed steel, by William E. Snow, first of two installments, in Machinery, March 1932, *p.* 486, 2½ *pp., no illusts.*

Three types of heating equipment are available for heating high-speed to hardening temperature — the open forge, the gas furnace and the electric furnace. The latter has numerous advantages in regard to uniformity of temperature and ease of control. The best equipment for this work comprises a hardening furnace capable of maintaining a temperature of 2400 to 2450 degrees Fahr., and preferably no larger than is necessary for handling the work one piece at a time; a preheating furnace capable of maintaining a temperature of 1800 degrees Fahr., and of sufficient size to hold a number of pieces of the work; and a tempering or drawing furnace capable of maintaining a temperature of 850 to 1300 degrees Fahr. All these furnaces should be pyrometer-equipped, and a water-cooled tank of quenching oil is required.

—STEEL, 3-14-32

Differential Hardening

Treating parts for nonuniform hardness, in Metal Progress, March 1932, *p.* 47, 6 *pp.*, 5 *illusts.*

A satisfactory solution to the problem of producing parts of variable hardness is found in the case hardening process. This, of course, gives material hard and relatively brittle on the outside, changing inward to a tough and strong core. Certain areas of the surface may be left soft by the well-known expedient of copper plating these areas before carburizing. Primarily by controlling the carbon content, carburizing regulates the hardness of a part.

Since standard hardening practice comprises a heating, a rapid cooling and a moderate reheating, a single piece of steel with uniform carbon content may be given a differential heat treatment (and emerge with one desired portion much harder than another) in three ways: (1) Heating and quenching merely that portion which is desired to be hard; (2) heating the entire piece uniformly but quenching only those portions which are to be hard; and (3) reheating various portions of a uniformly hardened piece to a different degree, thus softening some regions more than others. Equipment and procedure for each of these three methods are discussed.

—STEEL, 3-14-32

Hot Galvanizing

A new heat application for hot galvanizing, by W. H. Spowers Jr., in Industrial Gas, March 1932, *p.* 7, 2 *pp., no illusts.*

By means of diffusion flame combustion (see page 36) in which gas is made to burn with an intensely luminous flame, highly radiant within itself, and with air for combustion reaching the gas by diffusion through the flame proper and not through any form of premixing, parts to be hot galvanized can be brought to temperature with more uniformity and speed than by convected heat alone.

A characteristic wire galvanizing installation designed on this principle is described, with special consideration devoted to the problem of side-fired vs. under-fired equipment. Comparative data show how too low firing, or firing from underneath the pot, causes boiling of the dross with dangerously unstable bath conditions and a disproportionate percentage of dross resulting. Diffusion flame combustion is shown to be obtainable by an ingenious application of impact burners to a heat-radiating refractory bed installed between flame and side of kettle. Quality of product can be improved materially by proper dross control and judicious fluxing.

—STEEL, 3-14-32

Pyrometer Lamp

An improved comparison source for measuring furnace temperatures, by E. M. Watson and W. P. Zabel, in General Electric Review, February 1932, *p.* 120, 2 *pp.*, 4 *illusts.*

Recently a new lamp has been designed for measuring temperatures of furnaces or heaters. It consists of a bulb, shaped similarly to the standard electric light, in which is mounted a sturdy inverted U-shaped carbon filament, selected for uniformity, and a small eyelet. The filament and background to be measured are viewed through two small windows in the sides of the bulb. A black coating on the bulb reduces the glare from parts of the background in the vicinity of the area being measured. The small eyelet always appears black against the field and is an aid in keeping the eye focused on the filament when it is about to merge with the color of the furnace interior. The device differs from the customary type of optical pyrometer in that the objective lens and telescope are not used.

The lamp operates on 22 volts. When a reading is being taken it should be supported at about 2 feet from the observer and as near the object to be measured as is convenient. The current in the lamp is indicated by a meter and may be referred to a curve to find the temperature.

—STEEL, 3-14-32

Nitriding

Low-cost semicontinuous nitriding for small production, by R. R. Lapelle, in Automotive Industries, Mar. 5, 1932, *p.* 390, 2 *pp.*, 2 *illusts.*

A new type of nitriding furnace recently has been installed at a Detroit steel treating plant. Essentially the furnace consists of a movable furnace chamber mounted upon track wheels and located above a stationary hearth. The hearth, twice the length of the furnace, has mounted upon it two nitriding retorts, over either one of which the furnace may be placed. The furnace proper includes a structural steel shell lined with refractories, heavily insulated, and provided with heavy cast heating elements on the sidewalls of the chamber.

Circulating fans are located in the bottom of each nitriding container. These, together with proper distribution of the heating elements, provide uniform temperature distribution. A special dry powdered sealing material is used to prevent infiltration of air or loss of ammonia gas. Pots are of a special analysis steel finished with vitreous enamel. They are unaffected by the nitriding gas and do not adversely affect the dissociation rate.

—STEEL, 3-14-32

AJAX NORTHRUP

CORELESS INDUCTION FURNACES

A well known metallurgical engineer says:

. . . . *"The use of AJAX-NORTHRUP FURNACES gives greater uniformity in chemistry, greater purity physically, and makes practical the addition of alloys in the furnace rather than in the ladle."*

These are big factors in the production of stainless and alloy steels.

Specify . . . ***Induction Furnace Steel.***

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President and General Manager

Ajax Electrothermic Corporation
Trenton, New Jersey

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Electric Furnace Co., Ltd., London. Hirsch, Kupfer und Messingwerke, A. G., Eberswalde, Germany. Carlowitz, & Co., Shanghai, Hankow, Canton. Mitsui & Co., New York, Tokyo. Finspongs Metallverks Aktiebolag, Finspong, Sweden.

New Equipment

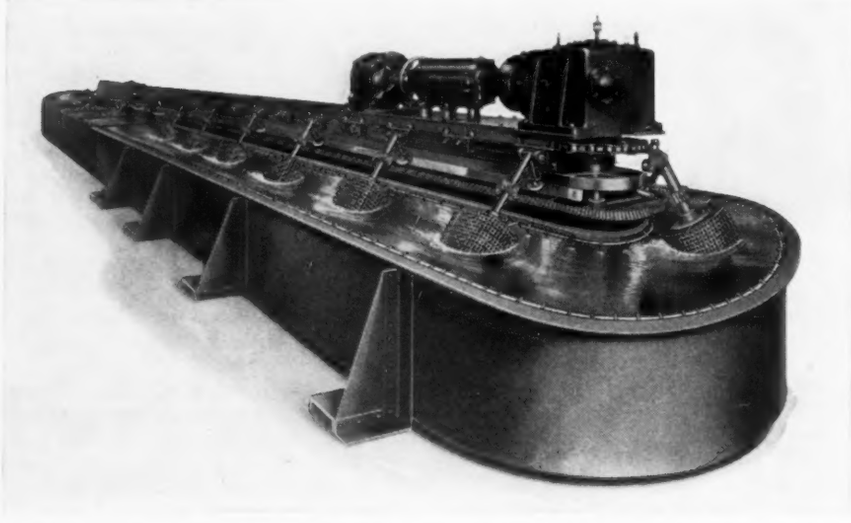
PRODUCTION FABRICATION TREATMENT FINISHING

Plating Machine Embodies Novel Features

Mitchell Engineering Co., Walnut street at Main, Springfield, O., is building a new automatic barrel type plating machine for plating of small parts such as bolts, nuts, washers, small steel stampings, etc. In this unit, the work is loaded into perforated drums, conveyed through the cleaning, rinsing, plating and dry operations, and automatically unloaded when the process is completed. While the drums are being conveyed through the various solutions, they rotate so as to mix up the parts and expose all surfaces to the anodes. This movement through the solution, in addition to the agitation effected by the revolving drums, causes the parts to pass continually through a new and enriched solution, preventing hydrogen occlusion.

In the plating machine shown in the accompanying illustration, a 6 volt current is employed. All operations are accomplished automatically and instead of being cleaned in a plain alkali solution and plain acid tumbling barrel, the parts are revolved in a tank where current is used for electro-cleaning and electro-pickling. This speeds up the action, promoting uniform cleaning and preventing over-pickling. The drums are removably attached to shafts which are pivoted to the conveyor chain. Pinions are keyed to each shaft and mesh with a rack to cause the drums to revolve as they are conveyed through the various tanks by the chain.

A variable speed mechanism is provided in order to regulate the time of deposit. Another variable speed unit also is provided in some cases to regulate the speed of the drums, irrespective of the speed of the conveyor chain. Bell cranks at the barrel shafts each have a hardened steel roller. Upon reaching the end of the tanks, this roller engages a cam, causing the barrel to rise and move over the end of the tank and then lower into the next tank. Frederic B. Stevens Inc., Detroit, is marketing the plating machine.



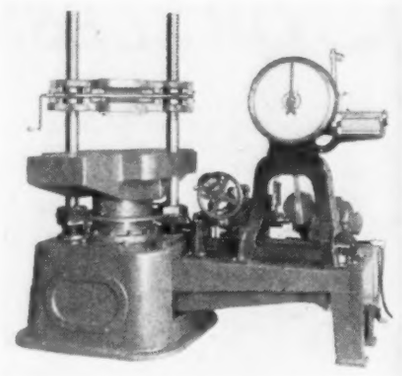
Automatic barrel-type plating machine manufactured by Mitchell Engineering Co and marketed by Frederic B. Stevens Inc.

◆

Testing Machine Has Wide Capacity Range

Toledo Precision Devices Inc., Toledo, O., has developed a universal testing machine to meet the peculiar requirements of the steel industry. A hydraulic press, commonly accepted by engineers as the most effective means, applies the force. The testing unit, shown in the accompanying illustration is designed for compression, tension and transverse bending tests. Force measured is transmitted through the test piece; therefore, the force measured is that applied to the test piece alone.

Accurate results are assured by use of the automatic springless pendulum type counterbalancing mechanism. Friction, oil thickness, temperature do not affect exact results, and ease of operation is another feature. Touching a button starts the motor, the operator regulating the speed by turning a wheel and observing the pressure applied from a dial. In addition, this device is compact, a complete machine of 200,000 pounds capacity occupying a space 4x7 feet.



Testing machine designed by Toledo Precision Devices Inc.

Additional features are: Capacities ranging from 25,000 to 200,000 pounds; double reversible dials on the dynamometer to increase capacity range; graphic recorder to chart the pressure trend at every stage of the test and breaking point; a wide variety of models.

◆

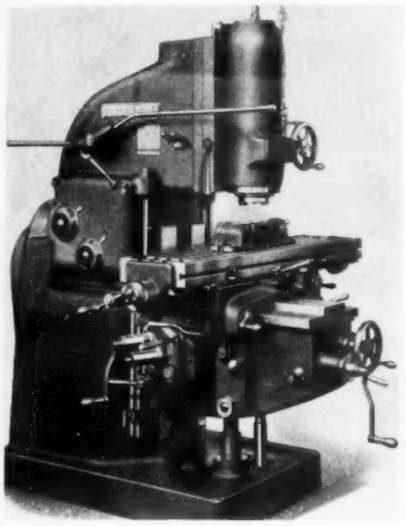
Innovations Characterize Milling Machine

Cincinnati Milling Machine Co., Marburg and South streets, Cincinnati, recently introduced a vertical milling machine embodying many new developments in design. One of the outstanding features is complete dual control making it possible to completely control all movements at both the front and rear normal operating positions. There are independent directional control levers for all three power feeds for the table, saddle and knee, respectively, at both front and rear. Saddle and knee levers are provided with interlocks to prevent engaging of both feeds at the same time. The unit is shown in the adjacent column on page 45.

The table is provided with a semi-

automatic cycle which enables the operator to rapid traverse to cut and automatically trip into feed and then stop at the end of the cut. Sixteen spindle speeds ranging from 20 to 500 revolutions per minute, and table feeds ranging from ½ to 20 inches are available. (A low and high series range of feeds are offered as optional.) Higher spindle speeds can be supplied at a small extra cost.

The vertical spindle is mounted in a head, solidly clamped to the frame of the machine, giving the advantage of a fixed head construction and at the same time an adjustable head



Vertical miller built by Cincinnati Milling Machine Co.

when the screws are loosened. Power feed to the head with rapid traverse is obtained by the use of a compact feed mechanism which takes the place of the hand feed box at the right side of the head. Sixteen power feeds to head are available.

◆

Metal Sawing Unit Has Two Operating Speeds

Peerless Machine Co., 1615 Racine street, Racine, Wis., has introduced a new standard type high speed metal sawing machine of 10x10-inch capacity. Standard equipment includes two speeds, one of 90 strokes per minute for tool steels, etc., and the other of 140 strokes per minute for machine steels, etc. The unit may be driven by a belt drive from a line shaft or by a motor, a motor stand being built integral with the machine.

Either full swivel vise or plain straight cutoff arrangement is facilitated by the design. Feed pressure changes are provided for on a graduated scale arrangement operated by a dial which gives the amount in pounds of feed pressure being applied to the saw blade. The drive pulley employs a clutch arrangement so that as the cutting operation is concluded the clutch is released automatically and the saw frame carrying the saw blade raises up and away from the work and stops.

A positive automatic lift of the saw blade on the noncutting stroke is provided so that regardless of how much feed pressure is being used there is no drag as the saw blade raises off the work completely with each return stroke. The pump for forcing the cutting compound to the saw blade is located in the rear of the machine on the outside so that it is easily accessible and not susceptible to damage from chips.

◆

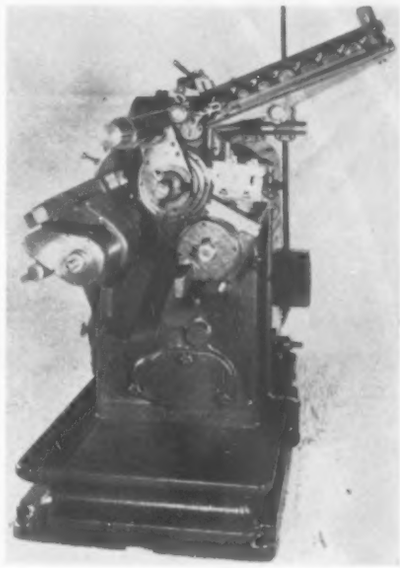
Hydraulic Work Loader Is Feature of Lathe

Seneca Falls Machine Co., Seneca Falls, N. Y., has developed a new model "K" lathe, designed primarily for machining short stubby work such as ball bearing races, gear blanks and other similar pieces that can be held on either an arbor or in a chuck. This machine is of extremely heavy design, weighing approximately 8700 pounds. Built for high speed, it is practical to run the spindle up to 2000 revolutions per minute if desired.

Feed for the tool mechanism is obtained through cams which, acting through arms, impart a rocking movement to the 6½-inch diameter tool bars which extend through the machine and carry the tool supports at the outer end. In other words, if it is necessary to take an angular cut, such as shown in the accompanying illustration, the tool bar may be rocked into position where it is held securely, and then by an additional feeding mechanism, the tool slide can be advanced to any desired angle and rate of feed.

A feature of the unit is the automatic device aranged to load roller bearing races on a stub arbor where they are held while being machined. After the race has been completed, it is ejected from the stub arbor and separated from the chips. The entire loader is operated hydraulically and safety features are incorporated to protect the machine in case of accident.

The machine can be furnished without the loader as a hand-operated unit or can be equipped with



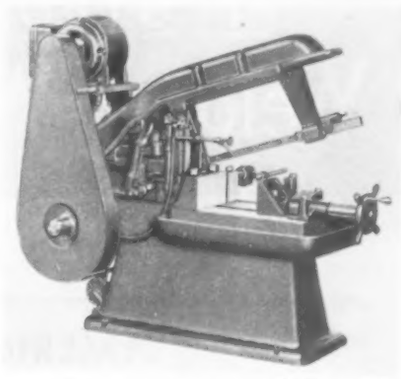
Model K lathe developed by Seneca Falls Machine Co.

any of the company's other automatic loading arrangements. When adapted to hand loading the machine is started by pressing a lever, after which it will proceed through a complete cycle and then stop. When equipped for automatic loading the cycle is continuous.

◆

Introduces New Type of Coated Electrode

Page Steel & Wire Co., Monessen, Pa., has developed a new type of coated electrode which is claimed to give extremely quiet operation with little or no sputter. Inasmuch as the arc is free burning, the molten pool of metal can be readily observed and the amount of metal deposited accurately judged. Grain structure of the weld is ideal and is essentially the same as that of mild steel and boiler plate base metal.



Peerless standard type high-speed metal sawing machine

PREMIER
TESTED
Welding Wire

Welds of Maximum Strength

You can be sure of maximum strength and satisfaction when you use Premier Tested Welding Wire—both electric and gas. No guesswork with this wire for each bundle is shop tested for uniformity—for perfect fusion—for impurities—for general efficiency before it gets into your hands. Thus, remarkable service records are the rewards of those who specify Premier. There's a type for every purpose and each length is plainly marked for grade. Write us about your welding problems—no obligation.

1831 — MORE THAN 100 YEARS of PROGRESS in WIRE MAKING — 1932

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors. Columbia Steel Company, Russ Building, San Francisco — *Export Distributors:* United States Steel Products Company, New York

Steel Rate Holds; Upturn Expected

Loans to Railroads, Heavier Structural Schedules, Cheering Factors—More Action in Motorcar Industry—Steel Prices Acquiring Strength

EVEN so hardy an industry as steel is finding a diet of hope rather trying, nevertheless with the support of minimum requirements from the railroads, automobile manufacturers and the general manufacturing trade and a slight lift from the building industry, it is maintaining operations at 25-26 per cent.

Indicators normally reliable continue favorably inclined for the long pull, and steel producers look for a "break" shortly. Loans by the Reconstruction Finance Corp. to railroads are permeating through to the latter's supply interests. Considerable structural steel awarded in the past 60 days is now being scheduled for rolling.

Some Ford material and parts makers are beginning to anticipate releases, expected this week now that the V-eight engine has finally been approved. Chevrolet is breaking through the inertia that has gripped the low-price automobile market in the absence of Ford, and has expanded operations, scheduling 7000 more units than in February. A preliminary estimate of March auto production is 150,000, compared with about 120,000 for February and 126,000 for January.

One year ago this week steel production was at the peak, not only of the spring rise but also of the entire year, at 57 per cent. Last week the range of operations was from 38 per cent at Cleveland to 17 in eastern Pennsylvania, the average being close to 26 per cent. Lighting of a blast furnace, resumption of the rail mill at Gary and increased sheet and strip production at Youngstown, if automotive releases materialize, may lift the rate a point or so this week.

As steel prices, most of them advanced over the past month, approach the period of second quarter commitments they appear to be acquiring greater strength. Weak spots are noticeable, and for specific business concessions continue to be made, but in general the ranks are being closed and progress toward more remunerative levels is being recorded. Evidencing this, the iron and steel composite of STEEL is up 2 cents this week to $29.55, the finished steel composite has advanced 10 cents to $46.92, the scrap composite is only moderately easier at $7.93, a decline of 4 cents.

Pacific Fruit Express has placed 100 refrigerator cars with its own shops. Wheeling & Lake Erie railroad is closing March 14 on 100 gondolas. Nickel Plate and Erie have distributed 12,000 to 13,000 tons of track fastenings. The Milwaukee has released 2000 tons of rails and 1000 tons of fastenings to the Illinois Steel Co., will duplicate this business for the Inland Steel Co. April 1, with 12,000 tons of rails still to allocate.

If the Pennsylvania railroad obtains a loan from the Reconstruction Finance Corp. for its eastern electrification project, as now seems probable, over 10,000 tons of structural material will be released. While structural awards the past week were below 7000 tons, fresh inquiry is large and widely spread.

Cincinnati has awarded 4000 tons of cast iron pipe; Dallas, Tex., 1100 tons. Bids are being taken on 12,000 tons of steel pipe by the Pacific Gas & Electric Co.; a 16-mile line at Omaha requiring 2800 tons is active. An order for 16,000 boxes of tin plate has been placed by the Nippon Oil Co. of Japan, two-thirds with German mills, one-third with American.

The drop of 102,521 gross tons in the United States Steel Corp.'s unfilled orders, to 2,545,629 tons as of Feb. 29, smallest on record, was due entirely to lack of customary railroad business. The second consecutive monthly gain in steel ingots and castings carried the February daily average to 58,382 gross tons, representing an operating rate of 27.5 per cent.

Composite Market Averages

	March 12	March 5	One Month Ago (Feb., 1932)	Three Months Ago (Dec., 1931)	One Year Ago (March, 1931)	Ten Years Ago (March, 1922)
Iron and Steel Composite	$29.55	$29.53	$29.56	$30.32	$31.66	$32.97
Finished Steel Composite	46.92	46.82	46.72	47.74	49.42	49.75
Steelworks Scrap Composite	7.93	7.97	7.89	8.22	10.39	11.16

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	March 12, 1932	Feb., 1932	Dec., 1931	Mar., 1931
PIG IRON				
Bessemer, del., Pittsburgh	$16.76	16.96	17.51	18.26
Basic, valley	15.00	15.00	15.00	16.75
Basic, eastern del., eastern Pa.	15.75	15.75	16.00	17.25
No. 2 foundry, del. Pittsburgh	16.76	16.76	17.51	18.01
No. 2 foundry, Chicago	16.50	16.50	16.60	17.50
*Southern No. 2, Birmingham	11.00	11.20	12.00	13.00
**No. 2X, Virginia furnace	18.00	18.00	18.00	18.25
**No. 2X, Eastern del. Phila.	15.76	15.76	16.01	18.26
Malleable, valley	15.50	15.50	16.10	17.00
Malleable, Chicago	16.50	16.50	16.60	17.50
Lake Superior, charcoal, del. Chi.	23.04	23.04	19.90	27.04
Gray forge, del. Pittsburgh	16.13	16.33	16.88	17.38
Ferromanganese, del. Pittsburgh	80.24	80.24	84.79	89.79

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

COKE				
Connellsville furnace, ovens	2.25	2.25	2.30	2.50
Connellsville foundry, ovens	3.25	3.25	3.25	3.25
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	26.00	25.80	28.25	30.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	28.00	30.00
Billets, open-hearth, Pittsburgh	27.00	27.00	29.00	30.00
Wire rods, Pittsburgh	37.00	37.00	35.00	36.00

	March 12, 1932	Feb., 1932	Dec., 1931	Mar., 1931
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.50	1.50	1.60	1.65
Steel bars, Chicago	1.70	1.60	1.60	1.70
Steel bars, Philadelphia	1.81	1.81	1.89	1.96
Iron bars, Chicago	1.70	1.70	1.60	1.70
Shapes, Pittsburgh	1.50	1.50	1.50	1.60
Shapes, Philadelphia	1.65	1.62½	1.69½	1.78
Shapes, Chicago	1.70	1.60	1.60	1.70
Tank plates, Pittsburgh	1.50	1.50	1.50	1.65
Tank plates, Philadelphia	1.69½	1.69½	1.73½	1.88½
Tank plates, Chicago	1.70	1.60	1.60	1.70
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.85	1.90
†Sheets, No. 24, hot, ann., Pitts.	2.20	2.15	2.40	2.35
Sheets, No. 24, galvan., Pitts.	2.80	2.75	2.90	2.90
Sheets, No. 10 blue anneal., Chi.	1.85	1.90	2.00	2.05
†Sheets, No. 24, hot, ann., Chi.	2.35	2.35	2.55	2.50
Sheets, No. 24 galvan., Chi.	3.00	2.95	3.05	3.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.90
Tin plate, per base box, Pitts.	4.75	4.75	4.75	5.00

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$10.25	10.25	10.25	12.90
Heavy melting steel, eastern Pa.	7.35	7.35	7.62½	10.50
Heavy melting steel, Chicago	6.75	6.80	7.50	9.75
No. 1 wrought, eastern Pa.	9.00	9.00	9.50	11.00
No. 1 wrought, Chicago	6.25	6.85	7.45	9.00
Rails for rolling, Chicago	9.50	9.85	10.00	12.00

Sheets

Automotive Orders Light—7000 Tons Placed for Radio City—Electrical Sheets Cut $10

SHEET PRICES, PAGE 49

Cleveland—District sheet mills have received word that the Dahlstrom Metallic Door Co., Jamestown, N. Y., has been awarded the contract for hollow-metal doors and trim to be used in the Radio City development, New York. This work will be spread over 3 years and take close to 7000 tons of sheets. It is understood the contract will be worked out on a cost-plus basis to the Jamestown firm, no sheet mill being willing to cover for 3 years. A purchase of fender stock and autobody sheets is to be expected shortly for the Fisher Body Co. plant here, Chevrolet issuing its second quarter inquiry for Flint, Mich. Prices on all grade continue irregular, with virtually no test afforded on the higher levels. Electrical sheets are now quoted: Armature grade, 3.00c; electrical, 3.50c; motor, 4.65c; dynamo grade, 5.35c; transformer A, 5.85c; transformer B, 7.10c; and transformer C, 7.60c. The recent cut was generally $10 a ton and was made by producers to eliminate wide price irregularities.

New York—Sheet specifications are slightly larger, reflecting efforts of sellers to get tonnage in on first quarter contracts by March 15. New buying remains light.

Philadelphia — Sheets prices are holding firmly on a light volume of business. Requirements for radio manufacture are expected to improve, one company to step up operations shortly.

Buffalo—The volume of sheet business originating with automotive manufacturers is disappointing to producers here. Other lines continue rather dull and operations average only 30 to 35 per cent.

Pittsburgh — Sheet specifications show a slight increase despite the lack of improvement in automotive demand. No orders other than small lots which have been appearing for a number of weeks are being received from the Ford Motor Co., although heavier releases are looked for momentarily. Electric refrigerator manufacturers represent practically the only large consuming industry placing orders approaching normal proportions. Steel drum and barrel manufacturers are fairly active. Current prices are holding fairly well. Producers are quoting 2.20c for hot-rolled annealed sheets; 2.85c for galvanized; 1.70c for blue annealed; and 2.90c for autobody.

Youngstown, O. — Quotations on all grades of sheets reflect less price-cutting today than in many months.

Automobile builders continue watchful for the new Ford models. Only routine tonnages are moving generally from mills to partsmakers and bodybuilders. Any appreciable increase in demand would be noted immediately. Most independent mills here were down to minimum operating rates last week, some being entirely idle, with prospects for resuming in part this week.

Cincinnati — Only moderate interest is being developed in forward sheet needs. Operations continue at 30 per cent with demand broadening. Specifications from the automotive industry are light.

Chicago—Sheet production continues at 30 to 35 per cent. Only a start has been made in demand for sheet roofing products from the Southwest. Inland Steel Co.'s new continuous plate and strip sheet mill has been completed and experimental operations have been carried on for several weeks. The company is entering the automobile and metal furniture sheet fields for the first time. Some galvanized business for second quarter has been placed at 2.95c base, mills. Refrigerator manufacturers have been fairly heavy consumers.

Current Finished Steel Prices

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, del.	1.70c
New York, del.	1.90c
Birmingham, base	1.70c
Philadelphia, del.	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, del.	2.01c
New York, del.	2.05c
St. Louis, delivered	2.07½c
Birmingham	1.85c
San Francisco c.i.f.	2.30c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.20c
Gary, Ind. Harbor, base	2.30c
Chicago, del.	2.35c
New York, del.	2.55c
Philadelphia, del.	2.51c
Birmingham, base	2.35c
St. Louis, del.	2.57½c
San Francisco, c.i.f.	2.80c

GALVANIZED NO. 24

*Pittsburgh, base	2.80c to 2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, del.	3.00c
Philadelphia, del.	3.16c
Birmingham, base	3.00c
St. Louis, del.	3.22½c
San Francisco, c.i.f.	3.45c

AUTOMOBILE NO. 20

Pittsburgh, base	2.90c

FURNITURE

Pitts., No. 10 heavy	2.65c
Pitts., No. 20 light	3.15c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.40c to 2.50c
Gary, base	2.50c to 2.60c
St. Louis, del.	2.77½c to 2.82½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.25c
Gary, Ind. Harbor, base	2.25c to 2.35c
Chicago, del.	2.30c to 2.40c
Philadelphia, del.	2.56c
New York, del.	2.60c
St. Louis, del.	2.62½c

COLD ROLLED NO. 20

Pittsburgh, base	2.75c
Gary, Ind. Harbor, base	2.75c to 2.85c
Chicago, del.	2.80c to 2.90c
Philadelphia, del.	3.06c
New York, del.	3.10c
St. Louis, del.	3.12½c

TIN AND TERNE PLATE

Per 100-pound box, Pittsburgh

Tin plate, coke base	$4.75
Long ternes, 24, unassort.,	2.85c to 3.00c

Gary, Ind., base 10 cents higher

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

Polished staples	2.50c
Galvanized staples	2.75c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing, (9-11 ga.)	$55.00
(12½ ga. and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.50c to 1.60c
Philadelphia, base	1.69½c to 1.79½c
*New York, delivered	1.80c to 1.90c
*Boston, delivered	1.92c to 2.02c
*Chicago base	1.70c
Cleveland, del.	1.70½c to 1.75½c
Lackawanna, N. Y., base	1.60c to 1.70c
Birmingham, Ala., base	1.65c to 1.75c
*Coatesville, Pa., base	1.60c to 1.70c
Pacific Coast, c.i.f.	1.80c
St. Louis, del.	1.97½c

Structural Shapes

Pittsburgh, base	1.50c to 1.60c
*Philadelphia, del.	1.65c to 1.75c
*New York, del.	1.77c to 1.87c
*Boston, del.	1.90½c to 2.00½c
*Chicago base	1.70c
Cleveland, del.	1.70½c to 1.75½c
Lackawanna, N. Y., base	1.60c to 1.70c
Birmingham, Ala., base	1.65c to 1.75c
Pacific Coast, c.i.f.	2.00c
Do., wide flange	2.10c

Bars

SOFT STEEL

Pittsburgh, base	1.50c to 1.60c
*Chicago base	1.70c
Birmingham, Ala., base	1.65c to 1.75c
Lackawanna, N. Y., base	1.60c to 1.65c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.81c to 1.91c
New York, del.	1.85c to 1.95c
*Boston, del.	1.92c to 2.02c
Pittsburgh, cold finish	1.65c to 1.75c
Pittsburgh, forg. qual.	1.75c to 1.85c

RAIL STEEL

Chicago Heights	1.50c to 1.60c
*Eastern mills	1.10c to 1.20c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.60c to 1.70c
New York, delivered	1.85c to 1.95c
Philadelphia, delivered	1.86c to 1.96c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Pitts., stock lengths, mill	1.50c to 1.60c
Chi., billet	1.75c
*Chi., rail steel	1.55c to 1.65c
Chi., rail steel, bridges and culvert	1.55c
*Philadelphia, cut lengths	1.86c to 1.96c
Cleveland, cut lengths	1.75c

Cold Finished Bars, Shafting

Base Pittsburgh, Chicago, Buffalo and Cleveland	1.90c to 2.00c
Shafting, turned and ground, Pittsburgh, Cumberland, Md.	2.35c to 2.80c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to 6.75 off
Carloads, Chicago dist.	7.00 to 7.50 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bars, 2.65c, mill

S.A.E.	Alloy Diff.	
2000	0.25	5100 .80 - 1.10
2100	0.55	Cr. 0.45
2300	1.50	51.00 Cr.
2500	2.25	spring 0.20
3100	0.55	6100 bars 1.20
3200	1.35	6100 Spring 0.95
3300	3.80	Cr., Ni., Van. 1.50
3400	3.20	Carbon Van. 0.95
4100 .15 to .25 Mo.	0.50	9250 (flats) 0.25 9250 (rds.,sq.) 0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05	

Strip, Hoops, Bands

*Hot strip, to 6 in., Pitts.	1.50c to 1.60c
*Do, 6 1/16 to 24-in., Pitts.	1.40c to 1.50c
*Hot strip to 6 in. Chi.	1.60c to 1.70c
*Do, 6 1/16 to 24 in.	1.50c to 1.60c
Cooperage hoop, Pitts.	1.60c to 1.70c
Do., Chicago	1.70c to 1.80c
*Cold-roll.strip,Pitts.,Cleve.	2.00c
*Worcester, 3 tons, over	2.20c

Rails, Track Material

Standard rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, mills	2.75c
Spikes, railroad, mills	2.60c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.60c
Spikes, boat, barge, Pitts.	2.90c
Track bolts, Chicago	3.50c
Do, standard, jobbers	73 off list
Track bolts, Chicago	3.50c
Tie plate, mills	$37.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread 75 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts 75 off

*Tire bolts 60 and 10 off

Stove bolts, 80-25-10 off in pkgs.; 80 25-10-2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished 75 off

HEXAGON CAP SCREWS

Milled	80-10-10-5 off
Upset 1 in. diam. and smaller	85-10 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset, 1 in. and smaller	80-10-5 off
Upset, larger than 1 in.	80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh 2.50c

Do. less carloads, 5 kegs or over 2.75c; less than 5 kegs, 2.90c.

Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Rivets

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. smaller, Pitts.	70, 10 and 5 off
Chicago, Cleve.	70, 10 and 5 off

Bars

Valley and Chicago Mills Getting Fair Orders—New Carbon Bar Base Still Nominal

BAR PRICES, PAGE 49

Chicago—A few western automotive partsmakers have received small initial releases and specifications on which to figure for the Ford cars, and these have added further to bar mill orders. Bar production continues greater than plates and shapes, despite the recent spurt in structural specifications. Buyers are mildly interested in second quarter, but a few contract sales extending through part of that period are on the books at 1.70c, Chicago. Mills claim to have withdrawn 1.60c for all new business.

Boston—Henry Disston & Sons Inc., Philadelphia, is low bidder on 100 tons of hot-rolled manganese steel bars for the Springfield, Mass., armory, for rifle barrels, at 4.45 cents per pound, delivered at armory.

New York—Consumers of steel bars are specifying more freely on existing contracts made at less than 1.60c, Pittsburgh. It is believed in some quarters that these specifications may exceed actual requirements of consumers to the extent that 1.60c may not be fully tested for another month to six weeks.

Philadelphia—Buying of soft steel bars is still too light to test the market at 1.60c, Pittsburgh. Improvement in specifications is expected as the quarter nears its close.

Pittsburgh—Steel bar producers are adopting a firmer attitude in their present attempt to raise prices than has been noted for some time. New business still is too light to test adequately the 1.60c market since most buyers are covered at 1.50c, but the higher figure is uniformly named on new inquiries.

Youngstown, O.—Best week's new steel bar business in many weeks is reported for last week by important barmakers here. This business is coming from miscellaneous consuming sources and in the aggregate is making a rather satisfactory showing, enabling mills to operate around 40 to 50 per cent.

Cleveland—Some fairly good bar specifications have been received recently by accounts specifying on their approximate monthly needs, although periods between their specifications have been widened somewhat recently. The local base is continued at 1.65c on new business, one outside mill which continues to quote 1.70c, Cleveland, on noncontract business having lost several car-lot orders near here recently. Locally, the alloy bar base of 2.65c, mill, seems well observed, but reports persist this figure has been shaded to the west. In districts where the Cleveland base meets Pittsburgh competition on carbon bars, it is reported one mill is permitting accounts to continue second quarter contracts at first-quarter price and that 1.60c, Pittsburgh, is nominal as yet.

St. Louis—Firmness marks the situation in soft steel bars, with demand light. An eastern producer has notified its sellers here to withdraw all concessions below 1.60c. Pittsburgh, or 1.70c, Chicago, following the recent advance of $2 per ton in the East and at Chicago.

Cold Finished Bars Steady In Price and Demand

Cold Finished Prices, Page 49

Pittsburgh—Some second-quarter contracts for cold-finished bars are being entered at unchanged prices and shipments and specifications are steady but quiet. The automotive industry shows practically no improvement in requirements and demand from miscellaneous consumers is at an unchanged rate. The market is steady on the basis of 2.00c, Pittsburgh.

Cleveland—Cold-finished steel bar mills are apparently experiencing increased difficulty in finding business, the minimum of January and February apparently tending weaker. The market continues 1.90c, Cleveland, to large buyers in carloads.

Tin Plate Demand Improves Moderately

Tin Plate Prices, Page 49

Pittsburgh—Tin plate specifications show a slight gain and although mills still are unable to accumulate backlogs, production has increased a few points to 40 to 45 per cent.

New York—Nippon Oil Co. of Japan has placed 16,000 boxes of tin plate, one-third with American mills, for immediate shipment, and two-thirds with German makers for later delivery. The company formerly was a heavy buyer here, but this is the first time in many months that it has purchased the American product.

Youngstown, O.—Tin mills continue to operate at 45 to 50 per cent. Specifications are fair. Two more weeks may elapse before northwestern salmon-canning demand begins to be felt at the mills. Despite low-price foreign offers along the Atlantic seaboard, American mills generally are holding to $4.75.

Plates

Ship, Freight Car, and Highway Work Taking Tonnages—New Price Levels Not Fully Tested

PLATE PRICES, PAGE 49

Chicago — Bridge work supplies most of the scattered plate orders. About 1200 tons of plates will be purchased for the Illinois and Indiana highway departments shortly. Buyers are not much interested in forward commitments, and the 1.70c, Chicago, price on plates remains untested. Plate mill operations vary at 20 to 25 per cent. About 400 tons of plates and light structural material will be bought for a government lighthouse tender at Chicago.

Boston—Demand for plates, except for a 60-inch water line at Newton, Mass., is light, although improvement is noted in some quarters for miscellaneous small lots. Prices are unchanged with 1.70c, eastern mill, untested. Bids close March 22 for flasks and cylinders for the submarine CACHALOT, Portsmouth, N. H., while bids are in on several small boat repair jobs at Fort Adams, R. I. Requirements for Quincy, Mass., are included in 2000 tons for tank work placed by Standard Oil Co. of New York, last week.

New York—Some mills have yet to take a definite stand on plate prices for second quarter, although they indicate their intention of quoting 1.60c, Pittsburgh, or 1.70c, Coatesville, Pa. Meanwhile, the market is 1.60c to 1.70c, Coatesville, the latter nominal. Demand remains sluggish.

Philadelphia—Plates are 1.60c to 1.70c, base, Coatesville, Pa., with the latter price still nominal. The Mathis Shipbuilding Co., Camden, N. J., has booked two coast guard boats re-

quiring a total of 3000 tons of steel, mainly plates. An inquiry for 600 tons of 36-inch steel pipe for a line at Hanover, Pa., issued by Albright & Friel Inc., Philadelphia, may develop a plate order.

Pittsburgh—Plate business still is made up of small miscellaneous orders, with few large lots in early prospect. The river equipment market is slow. The 1.60c price is untested, although this figure usually is quoted on new business.

Cleveland—Close to 1800 tons of plates will be required for the 100 steel gondola cars for the Wheeling & Lake Erie railroad for which bids were taken to March 14. It is reported that R. W. Kaltenbach Corp., Bedford, O., has not yet closed on plates and shapes for the two floating cranes it will build for the navy, taking close to 1000 tons. Owing to confusion on the identity of the low bidder for the 120-ton East Cleveland, O., tank, definite award is being deferred. The going market appears to be 1.50c, Pittsburgh, although it is hoped 1.60c will apply for second quarter on all business.

St. Louis—A leading eastern mill has withdrawn all prices on plate below 1.60c, Pittsburgh, or 1.70c, Chicago. The market is quiet.

Contracts Placed

400 tons, penstock for Los Angeles to Consolidated Steel Corp., Los Angeles.
125 tons, Monte Bello conduit, to Acme Engineering Co., Baltimore.

Contracts Pending

700 tons, scow for unstated interest; inquiry by lower Great Lakes shipbuilding interest.
440 tons, pipe line dredge, United States engineers, Galveston, Tex.; Ingalls Iron Works Co., Birmingham, Ala., low.
400 tons, plates and light structurals for lighthouse tender at Chicago for United States war department.
Unstated tonnage, 100,000-gallon elevated steel tank, prison department of justice, Lewisburg, Pa.; bids March 17.

Wire Contracts Slow for Second Quarter Needs

Wire Prices, Page 49

Chicago—Second quarter contracting for wire products is making slow headway. Specifications of merchant products have leveled after rather steady gains since early in the year. On the other hand, manufacturers' wire, lagging for the last 60 days, again is more active from the automotive supply trade. Plain wire is quoted 2.25c, Chicago or western mills. Standard wire nails, at $1.95 to jobbers, are moving slowly.

Worcester, Mass.—Although volume shows but slight gains, a wider diversification of orders and inquiry cheers wire manufacturers.

New York—Lehigh Valley railroad is inquiring for its second-quarter requirements of wire products.

Pittsburgh—Recent improvement in business in wire products has been spotty and light, with demand for manufacturers' wire at a quiet and unchanged rate. Jobbers' stocks generally are low but the outlook for any substantial increase in buying for the spring season is rather poor. Second quarter prices will be unchanged from current levels and producers merely are extending present contracts. Standard wire nails are $1.95 in carload lots, with plain wire 2.20c and wire rods $37.

Cleveland—Wire and nail prices have been reaffirmed for second quarter at the unchanged levels of $1.95 a keg for nails in carlots and 2.20c for manufacturers' wire. Last week there was little change in demand, ordering still being of a depressed character.

Ford Inquiry Still Is Awaited by Ore Producers

Iron Ore Prices, Page 56

Cleveland—The Ford Motor Co.'s inquiry for Lake Superior iron ore, now past due, is not expected for another week or two. It usually is the first in the open market, prices being largely determined by the levels at which it is closed. No other inquiries have appeared. Shipments from Lake Erie docks to interior furnaces in February amounted to 42,954 gross tons, compared with 179,250 tons in the month last year. The amount of ore on docks March 1, as reported by the Lake Superior Iron Ore association, Cleveland, was 5,767,060 tons, compared with 6,011,374 tons March 1, 1931. Stocks at furnaces, however, as indicated by recent reports, are larger than at this time last year.

Railroads

Milwaukee Road Lets 2000 Tons of 16,000 to Be Bought Month by Month—Car Bids Delayed

TRACK MATERIAL PRICES, PAGE 49

Chicago—Chicago, Milwaukee, St. Paul & Pacific has awarded 2000 tons of rails and 1000 tons of track fastenings to Illinois Steel Co. and will award a similar tonnage about April 1 to Inland Steel Co. The road announces it will buy approximately 16,000 tons of rails on month-to-month purchases of about 2000 tons each. About 18,000 tons of rails has been scheduled for local rolling as a part of the Erie and Nickel Plate rails. Track fastenings sales are fairly active. Quick shipment is asked on all track accessories. Departments rolling track fastenings have speeded up slightly in the last ten days. Rock Island railroad announces it will spend about $30,000,000 this year for improvements to equipment and property.

Carriers are more active recently in placing orders for rolled steel car wheels than for other parts.

Pittsburgh—Local producers shared in the awards of track fastenings by the Nickel Plate and Erie, involving in all 12,000 to 13,000 tons. The Chesapeake & Ohio is inquiring for spikes for second quarter.

Cleveland—Owing to inability of some bidders to get their final tabulations in on the Wheeling & Lake Erie inquiry for 70-ton gondolas, bids will not be closed until March 14, instead of March 7. It has developed that the road will buy 100 cars, and among other finished steel items will take 1800 tons of plates. A number of mills are already figuring this business. The cars are to be used by the Wheeling & Lake Erie for traffic to the National Tube Co. plant at Lorain, O., it is understood.

Car Orders Placed

Fruit Growers Express, 25 refrigerator underframes, to Pressed Steel Car Co., Pittsburgh.
Pacific Fruit Express, 100 refrigerators, to own shops.
United States navy, five flatcars, to Koppel Industrial Car & Equipment Co., Pittsburgh.

Rail Orders Placed

Chicago, Milwaukee, St. Paul & Pacific, 2000 tons to Illinois Steel Co., Chicago, approximately 14,000 tons to be purchased later this year on month-to-month basis.

Car Orders Pending

Wheeling & Lake Erie, 100 70-ton gondolas; bids close March 14, instead of March 7.

Structural Shapes

Encouraging Tone to Market As Mills Prepare to Roll Early 1932 Bookings—Smaller Pending Items More Numerous—Chicago Price Steadier at 1.70c Base

STRUCTURAL SHAPE PRICES, PAGE 49

New York—Structural steel lettings in February at 4420 tons were the lightest since the Structural Steel Board of Trade started compiling them. This compares with 13,548 tons in January and 13,641 tons in February of 1931. Last week's awards continued light, few jobs being active taking more than 500 tons. Plain material at 1.70c, eastern mill, is untested.

Worcester, Mass.—Inquiry remains light in the face of the approaching ordinarily busy season. Awards are also small. Eastern Bridge & Structural Co. is ready to close on 120 tons for bridge over Middle river, Worcester.

Philadelphia—Shapes are holding at 1.65c to 1.75c, Philadelphia. Bids are in on 2500 tons for Reading Co. electrification work on the road's Chestnut Hill, Pa., and Norristown, Pa., divisions. American Bridge Co. is low on the Episcopal hospital here taking 600 tons. Activity is more pronounced in 100 to 200-ton pending shape items. Success of the Pennsylvania railroad's application for $55,000,000 from the Reconstruction Finance Corp. will release considerable tonnage here.

John T. Hill, Baltimore, was low bidder, at 1.965c, delivered, on 75 tons of channels for the navy yard at Norfolk, Va.

Buffalo—The structural outlook has brightened considerably during the past week. Nearly $4,000,000 worth of state construction is in prospect in Buffalo and in Gowanda, a suburb. Both projects involve good sized structural tonnages, but as yet not figured. A 250-ton Albany, N. Y., port inquiry is ready for early closing.

Pittsburgh—An increase in the number of new structural projects, accompanied by the appearance of greater interest in private work, gives a better tone to the market. The market on new business in plain material usually is quoted 1.60c although this price is untested.

Cleveland—The Canton, O., postoffice to take approximately 150 tons of shapes goes in for contractor bid at Washington March 31, cost being now estimated at over $700,000. It will probably be April at the earliest before the Cleveland postoffice plans are released from Washington. The Detroit postoffice, which several Cleveland contractors were figuring, bids having been rejected recently, will be revised to include 12 stories instead of ten. No award has been confirmed on the 2000 tons of shapes in Pennsylvania state bridges which went in late in February. Plain structural material continues to be shipped at 1.50c, Pittsburgh, but 1.60c is asked for second quarter.

Chicago—Occasional forward contracts for plain material are placed. Little of this is for second quarter, but some protections are extended into that period. For new buying, mills are withdrawing 1.60c, Chicago, for a straight quotation of 1.70c. The numerous postoffice projects in the North Central area bring out stiff competitoin. On one project plans were figured by 80 general contractors. Oklahoma highway commission will purchase 2500 tons of bridge work, and the state capitol building at Bismarck, N. Dak., 2000 tons, will be active within the next 60 days. Structural fabricators are withholding bids from some projects that are unduly competitive.

Birmingham, Ala.—Numerous contracts are reported by structural steel fabricators and better average of operations is now under way. Alabama fabricators expect to participate in the Madden Dam project, Panama Canal Zone.

Contracts Placed

850 tons, plant for United States Potash Co., Carlsbad, N. Mex., to Virginia Bridge & Iron Co., Roanoke, Va.

800 tons, aircraft shop, Baltimore, to Belmont Iron Works, Philadelphia.

740 tons, Northway apartments, Baltimore, to Dietrich Bros., Baltimore.

600 tons, baseball park, Columbus, O., for Columbus Baseball Club, to Mt. Vernon Bridge Co., Mt. Vernon, O.; R. L. Wirtz, Columbus, contractor. Incorrectly printed in STEEL, Feb. 22, to International-Stacey Corp., Columbus.

400 tons, apartment, Riverside drive, New York, to George A. Just Co., Long Island City, N. Y.

375 tons, bridge, Crawford county, Meadville, Pa., to Fort Pitt Bridge Works Co., Pittsburgh.

300 tons, annex to federal building, Butte, Mont., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, laundry building, Boston, to Boston Bridge Works Inc., Cambridge, Mass.

300 tons, hospital, Norristown, Pa., to F. M. Weaver, Lansdale, Pa.

300 tons, addition to power house for Minneapolis Street Railway & Power Co., Minneapolis, to Minneapolis-Moline Power Implement Co., Minneapolis.

285 tons, underpinning and approaches, Boston-East Boston traffic tunnel, Boston, to American Bridge Co., Pittsburgh.

260 tons, (including 17 tons concrete bars), cantilever bridge over Pend Oreille river, Newport, Wash., to unnamed Eastern interests; Colonial Building Co., Spokane, contractor.

225 tons, postoffice, Okmulgee, Okla., to Ingalls Iron Works Co., Birmingham, Ala.

155 tons, Belmont avenue subway, Fresno, Calif., to Judson-Pacific Co., San Francisco.

140 tons, library, Girard college, Philadelphia, to Belmont Iron Works, Philadelphia.

135 tons, geology building and dormitory, University of Texas, Austin, Tex.; 70 tons to Virginia Bridge & Iron Co., Roanoke, Va., and 65 tons to Central Texas Iron Works, Waco, Tex.; Christy-Dolph Construction Co., Dallas, Tex., contractor.

112 tons, Florida state bridge, to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, shapes and bars, postoffice, Norman, Okla., to Capitol Iron & Steel Co., Oklahoma City, Okla., and Concrete Engineering Co., Omaha, Nebr.; Christy-Dolph Construction Co., Dallas, Tex., contractor.

100 tons, shapes and bars, two school additions, Wethersfield, Conn., to Builders' Steel Co., and L. L. Ensworth & Son, both Hartford, Conn.; Allyn Wadhams Co., Hartford, contractor.

100 tons, shed, Albany, N. Y., to Ingalls Iron Works Co., Verona, Pa.

100 tons, tramway tower and silo, Canal Zone, to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, addition to Willard Storage Battery Co., plant, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

100 tons, boiler plant, Sunnyvale, Calif., dirigible base to Judson-Pacific Co., San Francisco; reported to unnamed interest in STEEL, March 7.

100 tons, bridge, Thurmont, Md., to Maryland Steel Products Co., Baltimore.

Unstated tonnage, rebuilding 5-story storage building, Fosters' Wharf Co., Boston, to Norfolk Iron Works,

Awards Compared

	Tons
Awards, week ended Mar. 11	6,277
Awards, week ended Mar. 4	24,299
Awards, week ended Feb. 27	6,732
Awards, this week in 1931	41,258
Av. weekly awards, 1931....	34,236
Av. weekly awards, 1932....	13,931
Av. weekly awards, Feb.	11,688
Total awards to date, 1931	323,528
Total awards to date, 1932	153,246

Quincy, Mass.; J. W. Bishop Co., contractor.

Contracts Pending

6000 tons, Troy-Menands bridge, N. Y.
2500 tons, bridge work, Oklahoma, including 2000 tons for bridge over Canadian river, Bridgeport, Okla.
2500 tons, electrification work, Reading Co., Norristown, Pa., and Chestnut Hill, Pa., divisions.
2000 tons, Pennsylvania state bridges; Highway Construction Co., Cleveland, contractor. About to be closed.
1500 tons, postoffice, Sacramento, Calif.; bids opened.
1300 tons, power house, General Electric Co., Schenectady, N. Y.
1000 tons, general exhibits building, Century of Progress exposition, Chicago.
900 tons, Medical Arts building, Duluth, Minn.
700 tons, highway bridges in Illinois; Vincennes Bridge Co., Vincennes, Ind., and Wisconsin Bridge & Iron Co., Milwaukee, low on 300 tons.
600 tons, Episcopal hospital, Philadelphia; American Bridge Co., Pittsburgh, low.
570 tons, piling, unstated Cleveland location, Gulf Refining Co., Pittsburgh.
500 to 1000 tons, sheet steel piling, Los Angeles; bids March 15.
550 tons, school, Cambridge, Mass.
500 tons, Professional Arts building, Norfolk, Va.
500 tons, bridges for Indiana highway commission.
500 tons, power house, Passaic, N. J.
450 tons building, Scranton, Pa.
400 tons, grain elevator, Albany, N. Y.
388 tons, sheet steel piling for groynes at Santa Monica, Calif.; bids March 23.
300 tons, highway bridge, Seville, Ill.
300 tons, postoffice, Jefferson City, Mo.
250 tons, addition, high school, Kutztown, Pa.; bids March 15.
250 tons, building extension, Ohio Salt Co., Rittman, O.
250 tons, harbor project, Albany, N. Y.; bids in.
235 tons, factory addition, Hoyt Bros., Newark, N. J.
150 tons, postoffice, Canton, O.; contractor bids March 31.
125 tons, library, Superior, Wis.
125 tons, state sanitorium, Mount Alto, Pa.; bids March 16.
115 tons, dormitory, E. W. Murphy School Inc., Dover, Del.; A. L. Lauritsen Co. Inc., Wilmington, Del., contractor.
100 tons, armory, Salinas, Calif.; bids opened.
100 tons, state teachers' college, Laurelton, Pa.; bids opened.
100 tons, postoffice, Tamaqua, Pa.; Conneen Construction Co., Philadelphia, contractor.
Unstated, one 50-foot and three 49-foot spans, Michigan state highway, Kent county; bids March 22.
Unstated tonnage, $900,000 state armory building, Buffalo; bids about May 1.

Revise Pipe Standard

Washington—The standing committee in charge of the simplified practice recommendation on wrought iron and wrought steel pipe, valves and fittings has decided to drop 3½-inch nominal inside diameter pipe from the standard for double extra-strong pipe.

Concrete Bars

Laclede Steel Books 950 Tons for Hospital—See Mesh Outlet in New York This Season — Pittsburgh Mills Experience Substantial Gain—Prices Mixed

REINFORCING BAR PRICES, PAGE 49

New York—Concrete reinforcing bars are moving in small lots with some business being done at 1.95c, mill lengths, New York. New inquiry is light. Highway and bridge work is not developing much volume. A postoffice addition at Washington will take 400 tons, bids March 29.

Pittsburgh—Specifications for reinforcing bars have shown a substantial improvement this month and new business also is more active although of less proportions than the gain in releases against old orders. Mills now are quoting 1.60c, Pittsburgh, on new business, lower quotations being withdrawn.

Philadelphia—Reinforcing bars are 1.40c to 1.50c, Pittsburgh, for mill lengths. Demand is comprised of small lots.

Buffalo—Demand for reinforcing bars is expected to move up sharply in the next quarter, as building projects of large size are nearing contract stage and limited highway building programs are being approved in spite of the demand for tax reduction. Producers here think the additional gasoline tax will be helpful in road building in New York.

Chicago—Illinois highway department has awarded general contracts for about 700 tons of reinforcing bars covering road and bridge work, among 30 contractors, who will place the bars shortly. Illinois Bell Telephone Co. has awarded two exchange buildings totaling 500 tons. Billet bar quotations are at a minimum of 1.75c. Although scattered public projects are developing, fresh inquiries are slow.

Awards Compared

	Tons
Awards, week ended Mar. 11	**2,250**
Awards, week ended Mar. 4	**6,197**
Awards, week ended Feb. 27	**2,320**
Awards, this week, 1931	**14,112**
Av. weekly awards, 1931.....	**6,808**
Av. weekly awards, 1932.....	**5,211**
Av. weekly awards, Feb......	**3,327**
Total awards to date, 1931	**83,060**
Total awards to date, 1932	**57,321**

Contracts Placed

950 tons, superstructure, army and navy hospital, Hot Springs, Ark., to Laclede Steel Co., St. Louis; National Construction Co., Washington, contractor.
400 tons, exchange building for Illinois Bell Telephone Co., West Monroe street, Chicago, to Kalman Steel Corp., Bethlehem, Pa.
400 tons, school, Minneapolis, to Laclede Steel Co., St. Louis.
200 tons, eight-mile cutoff for Union Pacific railroad, Long Beach, Calif., to unnamed interest.
100 tons, Kress store, Honolulu, T. H., to unnamed interest.
100 tons, Twelfth street state bridge, Bellingham, Wash., to Northwest Steel Rolling Mills, Seattle.
100 tons, Winnetka, Ill., exchange building for Illinois Bell Telephone Co., Chicago, to Concrete Steel Co., New York.

Contracts Pending

6000 tons, steel mats, route 25, viaduct, New Jersey; Fredbrun Construction Co., New York, low.
700 tons, Illinois road and bridge work, general contracts distributed among 30 contractors.
400 tons, mesh, cutoff on Cleveland-Buffalo highway near Erie, Pa.; bids soon.
376 to 570 tons, postoffice, Sacramento, Calif.; bids opened.
250 tons, veterans' hospital, Aspinwall, Pa.; Henry B. Ryan Co., Chicago, contractor.
130 tons, waterworks reservoir, Ludlow, Ky.; bids on general contract opened March 10.
100 tons, for Los Angeles; bids March 11.
Unstated tonnage, army and navy hospital, Hot Springs, Ark.; general contract awarded to National Construction Co., Washington, on bid of $1,023,000.

Steel Shipped by Vessel From Cleveland to Detroit

The first vessel shipment of steel this season from Cleveland to Detroit was made last week in the steamer FELLOWCRAFT, Nicholson Transportation Co. The consignment amounted to approximately 800 tons, including plates and strip, from the Otis Steel Co. to the Midland Steel Products Co., and mis-

cellaneous sheet bars from the Corrigan, McKinney Steel Co., to several automotive companies.

Lake navigation has not yet opened officially, the trip being made exceptionally early in this instance to test new equipment in the vessel.

Bolt, Nut Specifications Hold at Steady Rate

Bolts, Nuts, Rivets Prices, Page 49

Pittsburgh — Specifications for bolts, nuts and rivets so far fail to reflect the recent advance in prices of bolts and nuts. Orders approximate the volume of the past several weeks, with little change in requirements of any of the larger consumers. Producers still hope for improvement in specifications shortly prior to the expiration of first quarter contracts. New contracts carrying the advanced price of 75 off for bolts and nuts are to be issued within a few days. Large rivets continued at 2.25c, Pittsburgh.

Philadelphia—Makers of bolts and nuts are closing some quarterly contracts at the new discount of 75 off.

Cleveland—Last week's orders for bolts and nuts continued virtually unchanged from the weekly rate through February. Although first quarter contracts have another two weeks to run, producers here are considerably encouraged over the favorable reception by competitors and consumers alike of the new price discount of 75 off list. It seems evident at this time that the new discount will hold when contracts are closed toward the end of this month.

Chicago—Producers of bolts, nuts and rivets have started solicitation of second quarter contracts. Announcement is made that tire bolts have been advanced to a discount of 60 and 10 off, instead of 60, 10 and 10, following the advance in bolts and nuts. Full finished nuts now are 75, 10 and 5 off instead of 75, 10, 10 and 5. Specifications are slow from the usual leading sources of demand. Several of the implement works are not planning active hay tool and harvester equipment production for some time.

Follansbee Bros. & Co., Pittsburgh, report net loss of $849,992 for 1931, as against net loss of $451,970 in 1930. For 1931 an operating loss of $370,422 was reported. Depreciation of $431,167 was charged off. Current assets as of Dec. 31, 1931, totaled $3,887,437, of which $1,662,507 was cash, against current liabilities of $462,320.

Pipe

Cincinnati Awards 4000 Tons of Cast; Dallas, Tex., 1100 Tons—Municipal Demands Still Lead

PIPE PRICES, PAGE 60

Chicago—Several smaller municipalities are placing pipe for sewage and filtration plants. Traverse City, Mich., will take bids this week on about 500 tons of miscellaneous sizes for sewage disposal, and Oconto, Wis., will buy about 300 tons for waterwork construction. Cedar Grove, Wis., has tabulated bids for 250 tons of 6-inch pipe. Technicality of a bond issue is holding up 900 tons of 10 to 12-inch for Flora, Ill. Several short natural gas distributing steel pipe lines are being planned at several western points, including a 16-mile 18-inch line from Plattsmouth to Omaha, Nebr.

New York—United States Pipe & Foundry Co. is reported low on about 2000 tons of cast iron pipe for Hawthorne, N. Y. The Florence, N. J., foundry booked about 550 tons for North Creek. More than 500 tons are withdrawn as the result of abandonment of the project at Camillus, N. Y. Newark, N. J. formally closed on 700 tons with Warren Foundry & Pipe Co. Approximately 1000 tons of 12¾-inch pipe has been withdrawn, due to the indefinite postponement of stadium project in Jersey City.

Philadelphia — Albright & Friel Inc., Philadelphia, engineers, are inquiring for 600 tons of 36-inch steel pipe for a line at Hanover, Pa. Bids on concrete and cast pipe as alternates are being taken.

Pittsburgh—Pipe business is quiet and unchanged. Distributors' stocks of standard pipe are low but little increase in demand for building purposes is expected for another 30 days and the outlook is not overly bright. Difficulties in financing are believed to be deferring action on proposed line pipe projects. Activity in oil country goods is dormant while tubes and tubing are slow.

Birmingham, Ala.—Inquiries are more numerous and a few sales are noted. Demand is expected to increase in the spring. The United States Pipe & Foundry Co.'s award for Cincinnati calls for 4000 tons 4 to 12-inch pipe, which will be manufactured here.

Cincinnati—The United States Pipe & Foundry Co. has been awarded on low bid of $118,568 the contract for the following cast pipe, for the Cincinnati waterworks: 1800 feet of 4-inch; 75,000 feet of 6-inch; 25,000 feet of 8-inch; 1200 feet of 10-inch, and 40,000 feet of 12-inch, and about 175 tons of fittings, the latter to be produced at the Addyston plant in Cincinnati. The same company bid $143,610 in the event the city wanted to make the pipe here as an employment measure.

Cast Pipe Placed

4000 tons, 4 to 12-inch for Cincinnati, to United States Pipe & Foundry Co., Birmingham, Ala., plant.
700 tons, various sizes, for Dallas, Tex., to National Cast Iron Pipe Co., Birmingham, Ala.
550 tons, 6 and 8-inch, North Creek, N. Y., to R. D. Wood & Co., Philadelphia.
400 tons, 6 to 12-inch, Newton, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
400 tons small sizes for Dallas, Tex., to McWane Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

100 tons, 18 and 20-inch shore pipe and pontoon, New York, to Dover Boiler Works Inc., New York; American Rolling Mill Co., Middletown, O.; and Stacy Mfg. Co.

Cast Pipe Pending

598 tons, 6 and 8-inch Class 250, Glendale, Calif.; bids March 17.
550 tons, small sizes, sewage and water project, Camillus, N. Y., bids Feb. 16; project temporarily abandoned.
500 tons, miscellaneous sizes for Traverse City, Mich., sewage plant; bids March 14; Hoad, Decker, Scheucraft & Drury, Ann Arbor, Mich., engineers.
300 tons, 6 and 8-inch for Oconto, Wis., waterworks.
250 tons, 6-inch for Cedar Grove, Wis.; bids in.
150 tons, 2 to 8-inch for Lancaster, O.; bids March 15.
142 tons, improvement Aurora avenue, Olympia, Wash.; bids in.

Steel Pipe Pending

8000 to 12,000 tons, 28-inch, Pacific Gas & Electric Co., San Francisco; bids being taken.
Unstated tonnage, 16-mile 18-inch pipe line from Plattsmouth to Omaha, Nebr., for Northern Natural Gas System, Omaha; Fredell Construction Co., Denver, general contractor.

Tubing Goes to Summerill

Dayton, O.—Summerill Tubing Co., Bridgeport, Conn., has been awarded 1500 feet chrome molybdenum steel tubing for the air corps, Wright Field, at 13.5c delivered.

Strip

Little Inquiry Out for Second Quarter — Quotations Nominal As Most Users Covered Ahead

STRIP PRICES, PAGE 49

Pittsburgh—Strip producers are taking a stronger stand on prices for second quarter in naming 1.50c and 1.60c for hot strip and 2.00c for cold-rolled strip, representing advances of $1 to $2 a ton over the recent market. These quotations still are nominal since buyers are covered at old figures and little activity is noted in forward purchases. Specifications are only holding their own, the automotive industry continuing to buy sparingly. Production is unchanged around 20 to 25 per cent.

Worcester, Mass. — Cold-rolled strip demand is steady. A movement to raise prices to 2.20c, Worcester, is in prospect although lack of concerted action has so far balked the move.

New York—One hot strip producer has definitely adopted a spread of 1.40c to 1.50c and 1.50c to 1.60c, Pittsburgh, on the wide and narrow sizes, respectively. These are effective at once, and to apply to second quarter. Some sellers are expected to take definite position within the next few days. Trading remains light.

Philadelphia—Hot strip sellers are quoting 1.40c and 1.50c, Pittsburgh, for second quarter, with $2 premium for less carloads. Cold-rolled strip is 1.90c to 2.00c, Pittsburgh, with the outside usually named on new business. Trading is light.

Youngstown, O.—Paralleling demand for sheets runs the hot and cold-rolled strip trade in this district. One mill accumulated sufficient specifications to warrant resumption of the hot-rolled mills late March 9 with the idea of finishing out the week. Others have been running at greatly reduced rates. Most demand is from miscellaneous sources. Quotations have firmed but are unchanged.

Cleveland—Strip steel mills which withdrew all their second-quarter asking prices week before last, came out last week with 1.40c, Pittsburgh, for hot-rolled, 6 1/16 to 24-inches, and 1.50c for hot up to 6 inches in width. The market so far is being firmly quoted at 2.00c, Cleveland, on cold-rolled strip. However, both price stands have not encouraged ordering. The immediate outlook is far from encouraging, as in many cases fairly large buyers' orders for shipment have dwindled.

Chicago—While hot-rolled strip prices have not been formally announced for second quarter, mills here are quoting on forward business 1.60c for narrow sizes and 1.50c, Chicago, for wide material. Second quarter inquiry is scant. No strip business has been placed in this territory by Ford. Cold-rolled operations remain at about 20 per cent. The price is 1.90c to 2.00c, Pittsburgh-Cleveland, the 2.00c price applying to second quarter business.

Operations Are a Shade Stronger at 25.5 Per Cent

Youngstown, O.—Steel plant operations last week averaged fractionally above 30 per cent, up more than a point from the preceding week, and are expected to hold at above 30 per cent for the first half of the current week. Twenty-one of 68 open hearths in the Mahoning valley are operating. Automobile steel business is expected to lift schedules here at any time, but in the meantime continues of routine character. Production of pipe and other finished steel continues weak and irregular. Operations a year ago were at 51 per cent, the 1931 high level here.

Operations, week of March 12	**25.5**
Operations, week of Mar. 5	**25**
Operations, week of Feb. 27	**25**
Operations, this week, 1931	**55.5**
High for 1932, Feb. 6	**28.5**
Low for 1932, Jan. 2	**22**

Philadelphia — Steelworks operations in the East continue unchanged at about 17 per cent. No immediate change is in prospect.

Buffalo—Steelmaking operations held unchanged at 27 per cent last week but due to staggered schedules the rate this week probably will be down to 17 per cent. Last week 10 open-hearth furnaces were pouring; 6 are scheduled for this week.

Pittsburgh—Ingot production is fully maintained at a 25 per cent rate. Some small plants have increased their schedules slightly over the past few weeks but no sharp gains are in early prospect. Lighting of a blast furnace by an independent producer gives the district 11 active steelworks stacks out of 54. Sheet output is unchanged at 25 per cent but tin plate is higher at 40 to 45. Pipe and strip continue 20 to 25.

Cleveland—At 38 per cent last week, steel mill operations were off two points from the 1932 high set in the preceding week. The 38 per cent rate meant operation of 13 of 34 open hearths here last week: five of 14 for Corrigan, McKinney Steel Co.; two of eight for Otis Steel Co.; and six of seven for American Steel & Wire Co.

Chicago—Open-hearth operations this week will be slightly lower at about 23 per cent for the district. Ingot production in the week just closed was 24 per cent. The Illinois Steel Co. rail mill at Gary, which again has been down for a brief period, may resume this week. Nine of the district's 36 steelworks blast furnaces are active.

Birmingham, Ala. — The 29 per cent operating rate reported for last week apparently will hold over for this week. Tennessee, Coal, Iron & Railroad Co. is operating 5 open-hearth furnaces at Fairfield, while the Gulf States Steel Co. has two 90-ton furnaces on at Gadsden, Ala.

Warehouse Volume Gains And Prices Are Steady

Warehouse Prices, Page 60

New York—While the March volume thus far is slightly ahead of that of February with most jobbers, the seasonal gain is slight and in some instances hardly noticeable. Prices are unchanged and steadier.

Cincinnati—New rate cards being distributed by warehouses show no change in base prices, but reflect the freight surcharge. Demand is not improved.

Philadelphia — Buying of steel products from warehouse continues light and prices have undergone no change.

Pittsburgh—Sales continue at the quiet rate prevailing for the past eight weeks, with little change in number of orders or tonnage. Prices are unchanged.

Detroit—Uncertainty as to actual Ford plans has continued to affect steel jobbing sales adversely.

Chicago—Slight gains in steel warehouse sales have occurred since the beginning of this month, the volume being comparable to the first week of February. Demand has been ahead of late last month, prices remaining fairly steady.

Raw Material Prices

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$16.50
Pittsburgh, dist. fur.	16.00
Pittsburgh, delivered	16.63 to 17.13
Valley furnace	15.00 to 15.50
Cleveland fur., local del.	15.50 to 16.00
Philadelphia, delivered	15.26 to 15.76
Virginia furnace	17.50
Granite City, Ill., fur.	16.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	19.91 to 20.41
Buff., all-rail, Brooklyn	19.40 to 19.90
Buff., all-rail, Newark	17.78 to 18.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	16.50 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.90 to 20.40
Buffalo, all-rail Newark	18.28 to 18.78
Buff., all-rail, Boston	20.91 to 21.41
Virginia furnace	18.00
Eastern, del. Phila.	15.76 to 16.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila.	16.26 to 16.76

MALLEABLE

Valley furnace	15.50
Cleveland fur., local del.	15.50 to 16.00
Pittsburgh dis. fur.	16.00
Pittsburgh, delivered	16.63 to 17.13
Chicago, furnace	16.50
Buffalo fur., local del.	15.50 to 16.00
Eastern Penna., delivered	17.76 to 19.91
Granite City, Ill., fur.	16.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Eastern Penn., del.	15.50 to 16.00
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	15.00

BESSEMER

Valley furnace	15.50 to 15.75
Pittsburgh, delivered	16.63 to 17.13
Pittsburgh, furnace	16.00

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	15.00
Pittsburgh district fur.	15.50
Pittsburgh, delivered	16.13 to 16.63

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19.50; 15—$23 to $24.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.25
Connellsville foundry	3.25 to 4.50
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.76 to 9.16
Chicago, ovens	7.50
New England, del.	10.50
St. Louis, del.	8.50
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens Connell., basis	5.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.75

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	9.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% man.	9.50 to 10.00
North African low phos.	8.00 to 9.00
Swedish basic, 65%	8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot and future short ton unit, duty paid	$10.75 to 11.00
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	24 cents
South African, 52%	23 to 24 cents
South African, 49-51%	22 to 23 cents
South African, 44-47%	21.00 to 21.50
Indian, 48-50% (nom.)	24 cents
Brazilian, 46-48% (nom.)	20 to 21 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$38.00
Missouri	35.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	38.00
Joliet, Ill., East Chicago, Ind.	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$61.50

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$27.00
Pittsburgh, bessemer	27.00
Youngstown	27.00
Cleveland	27.00
Philadelphia	32.75
Chicago	28.00
Forging, Chicago	34.00 to 35.00
Forging, Pittsburgh	33.00 to 34.00
Forging, Philadelphia	38.75 to 39.75

SHEET BARS

Pittsburgh	26.00
Youngstown	25.00 to 26.00
Cleveland	25.00 to 26.00
Chicago	27.00

SLABS

Pittsburgh	27.00
Youngstown	27.00
Cleveland	27.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	36.00 to 38.00

SKELP

All grades, Pittsburgh	1.50c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$75.00
*Ferromanganese, del. Pittsburgh	80.24
Spiegeleisen, 19-20%, domestic fur. spot†	27.00
Ferrosilicon, 50 per cent, freight all., c. l.	77.50
Do, less carload	85.00
Do, 75 per cent	126.00 to 136.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(Spot prices, $5 a ton higher.)	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do, for spot delivery	10.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.20
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.05 to 3.30
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis, (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molyte, lb. cont.	.80

†Carloads. Differentials apply to quant.
*To users of carloads to 1000 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel, domes., net ton, del. Pitts. equiv.	$20.31
Washed gravel, import duty paid tide. gross ton	19.50

Pig Iron

Cleveland Market Easier—Furnaces Competing Far from Regular Territories—Orders Light

PIG IRON PRICES, PAGE 56

Cleveland—Competition in the pig iron market is keen, furnace interests here, in the valley, and elsewhere going far outside their usual territories in seeking business. Iron from a valley merchant stack, with a freight rate to Cleveland of $1.76, plus a 13-cent surcharge, has been delivered here, in competition with Cleveland iron, indicating a price at least as low as $14.25, base, valley furnace. Valley producers also have been endeavoring to sell iron west of Cleveland. On the other hand, Cleveland iron has been offered in valley and Pittsburgh territory, at prices figuring back to around $14.50, base, Cleveland. The entrance of valley iron in Cleveland has depressed the local market, which has been quoted at $16, base, furnace, though buyers now claim to be receiving offers from a local source at $15.50, base. The market is easier, with a light volume of business. Shipments are holding up to the recent rate.

Boston—Melters are doing little toward anticipating future demands. Prices generally are unchanged, but untested. Buffalo iron is reported to have sold in car lots at about $14.50, furnace. The canal movement of iron is expected to start earlier than usual. Some southern iron has sold in Connecticut at $10, furnace, for No. IX. New England volume holds at the recent rate with $17, furnace, the price average.

New York—An inquiry for 200 tons of malleable iron features inquiry here. Buying is comprised of small lots for immediate shipment. Buffalo and eastern Pennsylvania iron continues nominally $14.50 to $15, furnace. Silicon differentials are waived in a number of instances, principally on the top grades. Eight hundred tons of Royal Dutch iron is to arrive in Hoboken, N. J., this month. It has been carried on a round-the-world cruise as ballast.

Philadelphia—The market is featureless, with foundry iron $14.50, base, eastern Pennsylvania furnace.

Buffalo—Several district foundries have booked fair size orders for early delivery. The output of radiator manufacturers appears to be improving, so that melt of merchant iron should be decidedly on the upgrade this month. In the East prices continue depressed and Buffalo is getting little new business for rail shipments. It probably will be possible to move iron by barge canal in about four weeks.

Pittsburgh—Lack of improvement in pig iron consumption is restricting new purchases and shipments. Recent buying has been limited to small lots, total tonnage unimproved over the rate of the past several weeks. Few inquiries are appearing. Quotations continue nominal to a large degree, generally $16, Pittsburgh, for No. 2 foundry, malleable and bessemer.

Youngstown, O.—Occasional sales of No. 2 foundry and malleable irons are noted but shipments from furnaces continue spasmodic. Qotations on all grades are unchanged, largely nominal.

Cincinnati—The pig iron market is dull, with most purchasing in small lots. Shipments indicate little change in the melt. Inquiries have not appeared for second quarter. Competitive conditions tend to drive down prices on northern iron.

Chicago—Buyers are not placing business ahead to any extent, due largely to their own meager order books. Price concessions are less frequent. A recent order for southern iron in northern Illinois brought out full silicon differentials on a $10 base, Alabama furnace. Jobbing foundries in this area expect to benefit from Ford releases, but thus far they have been negligible. Store foundries are depressed.

St. Louis—Pig iron shipments in this district in the first week of March were larger than in the comparable period in February. The situation appears more favorable, though current sales are light. Implement and stove manufacturers continue on reduced schedules. Prices are unchanged.

Birmingham, Ala. — Sales for delivery into the Middle West have improved recently, one company having booked 2500 tons. The base price holds at $10, for iron shipped out of the district, and $11 for local delivery.

Toronto, Ont.—A better undertone is apparent in the pig iron market, though purchases continue small. Consumption is improving slowly. Prices are unchanged.

Pittsburg Boiler & Machine Co., Pittsburg, Kans., has changed its name to McNally-Pittsburg Mfg. Corp. Thomas McNally is president and general manager.

Ford Inquiring for More Ferroalloys

Ferroalloy Prices, Page 56

New York—Ford Motor Co. is inquiring for 300 tons of ferromanganese for March-April shipment, in addition to the 500 tons of ferrochrome and 25 tons of silicomanganese recently noted. It is understood the ferromanganese inquiry includes tonnage originally inquired for earlier in the year. Ferromanganese is holding at $75, duty paid, on contracts up to 1000 tons. Specifications generally show little change. Domestic spiegeleisen, 19 to 21 per cent, is $27, furnace.

Pittsburgh—A slight improvement is noted in demand for ferroalloys, though the continued low rate of steelmaking operations restricts shipments. Spot prices of $75 for ferromanganese and $27 for spiegeleisen apply on small lots.

Chicago—A fair amount of short-term buying in ferroalloys is noted. The necessary upturn in steelworks operations for improved demand still seems remote. Prices are steady. Specifications have been a little heavier since March 1.

Semifinished Steel Is in Light Demand

Semifinished Prices, Page 56

Pittsburgh—Shipments of semifinished steel show practically no change compared with the quiet rate prevailing over the past 30 to 60 days, despite occasional fluctuations in finishing mill operations. New business also is slow, orders being small. The market nominally continues $27 for rerolling billets and slabs, with $26 the usual quotation on sheet bars. Wire rods are $37.

Philadelphia — Although an advance of $2 a ton on billets is reported contemplated, nothing definite has developed. Business is almost at a standstill.

Youngstown, O.—A few billets and sheet bars are being shipped to sheet and strip mills, but on the whole there is little activity in the market. Open-hearth furnace operations in this district continue restricted to requirements for each week's scheduled operating rates at finishing mills. Sales are almost entirely on the basis of $26, Youngstown, Pittsburgh and Cleveland.

Scrap

Prices Holding but Movement Is Slow—Railroad Offerings Light As Prices Are Thought Low

Chicago—Scrap buyers are seeking to maintain inventories as the current market is regarded as presenting favorable values. Restricted bank loans, on the other hand, are holding back contemplated buying. Scrap prices continue to hold, and some views are that the market is poised for advances in some of the steelmaking grades. The heavy melting steel range is nominal at $6.75 to $7.25. Frequent delays occur in the shipment of railroad scrap purchased by dealers because of the reduced working forces of the carriers in loading material in cars. St. Paul railroad withdrew a list late last week because of low prices offered by dealers. Shipments of cast borings to East Chicago docks are active.

Boston—New England foundries

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.00 to 7.50
Boston, dealers	4.00 to 4.50
Buffalo, No. 1	8.00
Buffalo, No. 2	6.25 to 6.50
Chicago	6.75 to 7.25
Cinci., deal.	6.75 to 7.25
Cleve., No. 1	7.25 to 7.75
Cleve., No. 2	7.00 to 7.50
Det., No. 1 deal.	5.75 to 6.25
Det., No. 2 deal.	4.00 to 4.50
E. Pa. del. mill	7.00 to 7.75
N. Y. deal. R. R.	4.50 to 5.50
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	3.50 to 4.00
Pitts. No. 1	10.00 to 10.50
St. L. No. 1 sel.	7.00 to 7.50
Federal, Ill.	6.50 to 7.00
Granite City, Ill.	6.00 to 6.50
Valleys, No. 1	10.00

COMPRESSED SHEETS

Buffalo, dealers	6.25 to 6.50
Chi. (Factory)	5.75 to 6.25
Cleveland	7.00 to 7.25
Detroit, dealers	5.75 to 6.25
E. Pa. new mat.	6.50 to 7.50
Pittsburgh	9.75 to 10.00
Pittsburgh	9.75 to 10.25

BUNDLED SHEETS

Buffalo	5.25 to 5.50
Cinci., deal.	6.00 to 6.50
Cleveland	6.00 to 6.50
Eastern Pa.	5.50 to 6.00
Pittsburgh	8.50 to 9.00
St. Louis	3.50 to 4.00

SHEET CLIPPINGS LOOSE

Chicago	3.50 to 4.00
Cincinnati	3.50 to 4.00
Detroit, dealers	3.00 to 3.75
St. Louis	3.50 to 4.00

STEEL RAILS SHORT

Birmingham	10.50 to 11.00
Boston, dealers	4.25 to 4.75
Buffalo	10.00 to 11.00
Chicago (3 ft.)	8.50 to 9.00
Chicago (2 ft.)	9.50 to 10.00
Cinci., deal.	10.50 to 11.00
Detroit, deal.	10.50 to 11.00
Pitts. (open-hearth, 3 ft. and less)	12.00 to 12.50
St. Louis	11.00 to 11.50

STOVE PLATE

Birmingham	6.50 to 7.00
Boston, con.	4.50 to 5.00
Buffalo	8.50 to 8.75
Chicago, net	5.75 to 6.25
Cinci., deal. net	4.00 to 4.50
Det., net deal.	3.00 to 3.50
Eastern Pa.	7.00
N. Y., deal. mill	4.50 to 5.00
St. Louis	6.50 to 7.00

COUPLERS, SPRINGS

Buffalo	9.75 to 10.25
Chicago	8.00 to 8.50
Eastern Pa.	8.50 to 9.50
Pittsburgh	11.00 to 11.50
St. Louis	8.00 to 8.50

ANGLE BARS—STEEL

Chicago	7.50 to 8.00
St. Louis	7.00 to 7.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.00 to 11.50
Cleveland bil. and bloom crops	14.00 to 14.50
Eastern Pa.	12.00
Pittsburgh billet bloom crops	13.00 to 13.50
Pitts., sheet bar crops	13.00 to 13.50

FROGS, SWITCHES

Chicago	6.75 to 7.25
St. Louis	7.50 to 8.00

SHOVELING STEEL

Chicago	6.75 to 7.25
Cleveland	6.25 to 6.50
St. Louis	6.50 to 7.00

RAILROAD WROUGHT

Birmingham	6.50 to 7.00
Boston, dealers	7.00 to 7.50
Buffalo, No. 1	5.00 to 5.50
Buffalo, No. 2	8.00
Chicago, No. 1	6.25 to 6.70
Chicago, No. 2	6.75 to 7.25
Cinci., No. 2	6.50 to 7.00
Eastern Pa.	9.00
N. Y., No. 1, deal.	6.00 to 6.50
Pitts., No. 2	10.00 to 10.50
St. Louis, No. 1	4.50 to 5.00
St. Louis, No. 2	6.50 to 7.00

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	8.50 to 9.50
N. Y., deal.	5.00 to 5.50

BUSHELING

Buffalo, No. 1	6.25 to 6.50
Chicago, No. 1	5.25 to 5.75
Cinn., No. 1 dl.	4.75 to 5.25
Cinn., No. 2	3.00 to 3.50
Cleve., No. 2	4.25 to 4.50
Det., No. 1 new deal.	4.50 to 5.00
St. L., No. 1	5.50 to 6.00
Val. new No. 1	9.00 to 9.50

MACHINE TURNINGS

Birmingham	3.50 to 4.00
Boston, dealers	1.05 to 1.55
Buffalo	4.75 to 5.25
Chicago	4.00 to 4.25
Cinn., deal.	3.25 to 3.75
Cleveland	4.00 to 4.50
Detroit	3.25 to 3.75
Eastern Pa.	4.00 to 4.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	7.50 to 8.00
St. Louis	2.50 to 3.00
Valleys	7.25 to 7.75

BORINGS AND TURNINGS For Blast Furnace Use

Boston, dealers	1.25 to 1.50
Buffalo	6.00 to 6.25
Cinn., deal.	3.25 to 3.75
Cleveland	6.00 to 6.25
Detroit, deal.	4.00 to 4.50
Eastern Pa.	3.00 to 3.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	6.75 to 7.25

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.50 to 4.00
Boston, chem.	5.50 to 6.50
Boston, deal.	1.05 to 1.55
Buffalo	5.75 to 6.25
Chicago	4.50 to 5.00
Cinn., deal.	3.25 to 3.75
Cleveland	6.00 to 6.25
Detroit, deal.	4.00 to 4.50
Eastern Pa.	3.00 to 3.50
E. Pa., chem.	10.00 to 11.00
N. Y., deal.	1.50 to 2.00
Pittsburgh	6.75 to 7.25
St. Louis	5.00 to 5.50

PIPE AND FLUES

Cinn., deal.	4.00 to 4.50

RAILROAD GRATE BARS

Buffalo	5.25 to 5.75
Chicago, net	5.50 to 6.00
Cincinnati	4.50 to 5.00
Eastern Pa.	7.00
N. Y., deal.	5.00 to 5.50
St. Louis	5.75 to 6.25

FORGE FLASHINGS

Boston, deal.	5.00 to 5.25
Buffalo	6.25 to 6.50
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, deal.	1.50 to 2.00
Chicago	9.50 to 10.00
Eastern Pa., del.	6.75

ARCH BARS, TRANSOMS

Chicago, net	6.25 to 6.75
St. Louis	6.50 to 7.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	6.75 to 7.25
Chi., steelworks	5.75 to 6.25
Cleveland	6.75 to 7.00
Eastern Pa. del.	7.00 to 8.00
Pittsburgh, O. H.	8.75 to 9.25
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	11.50 to 12.00
Boston, ship. pt.	11.00 to 11.50
Buffalo	12.00 to 12.50
Chicago	11.25 to 11.75
Eastern Pa.	14.50 to 15.00
St. Louis	11.50 to 12.00

SHAFTING

Bos., ship. pt.	10.00 to 10.50
Chicago	7.30 to 7.85
N. Y., deal.	9.00 to 9.50
St. Louis	8.50 to 9.00
E. Penna.	13.00 to 14.00

CAR WHEELS

Birming. iron	8.50 to 9.00
Boston, iron	11.00 to 12.00
Buffalo, iron	9.25 to 9.75
Buffalo, steel	9.75 to 10.25
Chicago, iron	7.00 to 7.50
Chi., rolled steel	8.50 to 9.00
Cincinnati iron	8.50 to 9.00
E. Pa. steel	8.50 to 9.00
E. Pa. iron	10.00
Pitts. iron	10.00 to 10.50
Pitts., steel	11.00 to 11.50
St. Louis, iron	6.00 to 6.50
St. Louis, steel	6.50 to 7.00

NO. 1 CAST SCRAP

Birmingham	8.00 to 9.00
Buffalo (Mach.)	9.50 to 10.00
Buffalo, cupola	8.50 to 9.00
Boston, textile	6.50 to 8.00
Chicago, mach.	8.40 to 8.95
Chi., railroad	7.00 to 7.55
Chicago, agri.	6.45 to 7.00
Cinn., mach. cup.	9.50 to 10.00
Cleve. cupola	10.00 to 10.50
Det., net deal.	8.00 to 8.50
E. Pa. cupola	10.00 to 10.50
N. Y. cup. deal.	7.00 to 7.50
N. Y., del. local foundries	11.00
Pitts., cupola	9.50 to 10.00
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	7.00 to 7.50
St. L., No. 1	6.50 to 7.00

HEAVY CAST

Boston	6.00 to 6.50
Bost. mach. cast	8.00 to 9.00
Buffalo, break	8.00 to 8.50
Cleve., break	6.00 to 6.50
Detroit, auto, net deal.	10.00 to 10.50
Det., break., dl.	4.75 to 5.25
Eastern Pa.	9.00
N. Y. break, dl.	5.75 to 6.00
N. Y. No. 1 dl.	7.00 to 7.50
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston R. R.	8.50 to 9.00
Buffalo	9.50 to 10.00
Chicago, agri.	6.50 to 7.00
Chicago, R. R.	6.75 to 7.25
Cinci., R. R. del.	8.75 to 9.25
Cinci., agri. del.	8.50 to 9.00
Cleveland, rail	10.00 to 10.50
Det. auto deal.	9.00 to 9.50
St. Louis, rail	5.50 to 6.00

RAILS FOR ROLLING 5 feet and over

Birmingham	9.25 to 10.00
Boston, deal.	6.00 to 7.00
Buffalo	8.50 to 9.00
Chicago	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
New York	6.25 to 6.75
St. Louis	9.00 to 9.50

LOCOMOTIVE TIRES

Chicago, cut	8.00 to 8.50
St. L., No. 1	8.00 to 8.50

LOW PHOS. PUNCHINGS

Chicago	9.50 to 10.00
Buffalo	10.00 to 11.00
Eastern Pa.	11.00
Pittsburgh	11.00 to 11.50

are taking little scrap and bids on various grades for outside shipment are too low to give the market additional strength. Dealers are offering $4.50 to $4.75 for textile cast, a grade moving well locally in normal times. Offers for No. 1 steel for Pennsylvania are not attractive when compared with local delivered prices, but demand in this district is light.

New York—Stove plate has moved at $6.75, delivered, Bayonne. Specification pipe sales at $7 to $7.50, Lebanon, Pa., are also reported. Movement of scrap, however, is light. Most No. 1 steel being bought in this district is for barge storage. Cast grades are dull with pipe foundries taking little tonnage.

Philadelphia—Buying of steel and iron scrap is generally dull but resumption of operations by New Jersey pipemakers after idleness of a month brings added interest in supplies. Cast car wheels are off $1 to $10, delivered, and cupola cast is also easier, holding at $10 to $10.50. The reduction in the latter is having the effect of checking shipments from New England.

Buffalo—Dealers are restricted in scrap deliveries to stove plate, cast and mixed borings and turnings. Other materials are under almost absolute embargoes, some of which have been in effect for weeks.

Cleveland—Unchanged quotations continue to rule in iron and steel scrap. Shipments here have not shown any notable change, although a temporary stop order has been put out on mixed borings by a local consumer.

Pittsburgh—Iron and steel scrap still reflects steady but quiet conditions in steelmaking. Prices are unchanged. Heavy melting steel on the March list of the Pennsylvania railroad is understood to have brought around $10.50 while last consumer sales of this grade were at $10.25 and $10.50. New buying is limited to small lots.

Detroit—Though scrap trade sentiment is bolstered by a more hopeful outlook by several steel mills, dealers' buying prices have not been changed and published levels are holding.

Cincinnati — The scrap market continues sluggish, with important consumers buying conservatively and in some cases showing interest only in bargains. Quotations are nominal. The Louisville & Nashville has failed to ask bids on scrap for three months.

St. Louis—The market for steel and iron scrap continues dull. Railroad lists are light and little scrap is coming in from the country, largely the result of present low prices. Stocks in hands of the mills in the St. Louis industrial district are low, with the exception of one or two.

Birmingham, Ala. — Influenced by the pig iron market, old material is moving slowly and quotations are still weak. Encouragement is taken from reports that pressure pipe makers and other foundries are receiving contracts which bespeak a little activity in early spring.

Toronto, Ont.—Demand for iron and steel scrap is showing slow but steady improvement. Consumers are entering the market at regular intervals for supplies, but are not buying for future delivery. No. 1 machinery cast is in fair demand and stove plate and wrought scrap have improved, while other lines continue spotty. Steel scrap shows no improvement and sales are in small lots. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

Per Gross Ton

MONTREAL

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Would Lower Scrap Rate

Boston—A reduction from $1.89 to $1.25, including switching charges, on iron and steel scrap shipments between Boston and Worcester, Mass., with a minimum of 67,200 pounds, has been proposed to the New England Freight association.

Coke

Cold Wave Stimulates Market With Demands for Domestic Fuel—Foundry Grades Quiet

COKE PRICES, PAGE 56

Pittsburgh—Improved demand for domestic heating coke represents the only change in activity in the beehive coke market. Consumption by foundries is quiet and unchanged while demand for furnace coke is slow. No new business in the blast furnace grade is appearing, with the spot market nominally unchanged at $2.25. Foundry coke continues $3.25 to $4.50.

New York—With foundry operations little improved, specifications for metallurgical coke continue light. Beehive furnace coke is $2, Connellsville, Pa., and beehive foundry coke, $3 to $3.25, Connellsville, on standard grades, and $4.50, Latrobe, Pa., on premium brands. By-product foundry coke is $8.76 to $9.16, delivered, Newark, N. J.; $10.50, New England; and $8.75, Philadelphia.

Cleveland—The cold weather has stimulated sales of domestic coke, dealers in northern Ohio being low on stocks, and by-product coke ovens now being called upon for larger supplies than they are currently producing. A continuation of demand at present levels is likely to result in higher prices, producers say. This is relieving a dull situation in demand for foundry grades.

Cincinnati—Price of domestic by-product coke will remain unchanged at least until April 1. A Cincinnati company is inquiring for 5000 tons of domestic grade. Shipments of foundry coke are at the February rate.

Chicago—Shipments of by-product foundry coke are slightly ahead of the first week of February. Foundry operations remain under 20 per cent. The price is unchanged at $7.50, ovens, and $8.25, plus 6 cents freight surcharge, delivered in the Chicago switching district.

Birmingham, Ala.—No increase in production is anticipated for some time, output at present being little more than half of normal. By-product foundry coke is steady at $4.50, ovens.

Wesbar Corp., West Bend, Wis., manufacturer of metal stampings, has received an order for 1,000,000 flashlight lanterns, which will keep the plant busy for nine months with night shift.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
½	58	44½	½	25	7
¾	62	50½	¾	30	13
1—3	64	52½	1—1¼	33	17
			1½—2	37	20

LAP WELD

2	57	45½	2	25	11
2½—6	61	49½	2½—3½	30	15
7—8	58	45½	4—6	32	19
9—10	56	43½	7—8	31	18
11—12	55	42½	9—12	28	13

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+11	+46
¾	60	49½	½	25	9
1—1½	62	51½	¾	30	14
2—3	63	52½	1—2	36	20

LAP WELD

Extra strong, plain ends

2	55	44½	2	31	15
2½—4	59	48½	2½—4	36	22
4½—6	58	47½	4½—6	35	21
7—8	54	41½	7—8	33	19
9—10	47	34½	9—12	23	10
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$32.00 to 33.00
Four-inch, Birmingham .... 36.00 to 37.00
Four-inch, Chicago ..... 41.40 to 43.40
Six to 24-inch, Chicago..... 38.40 to 40.40
Six-inch and over, N. Y..... 28.00 to 30.00
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.00c
Chattanooga..	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia..	2.45c
Pittsburgh	2.60c
Portland	2.50c
San Fran.	2.40c
Seattle	2.50c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.15c
Chattanooga..	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia..	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.25c
Buffalo	2.95c
Chattanooga..	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl...	2.50c
Los Ang. lcl..	2.80c
New York	2.65c-3.10c
Phila.	2.26½c
Pittsburgh	2.60c
San Fran. cl.	2.60c
San Fran. lcl.	2.90c
Seattle	2.50c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia..	2.45c
Pittsburgh	2.85c
Portland	2.50c
San Fran.	2.40c
Seattle	2.50c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

PLATES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles..	3.40c
New York(d)	3.30c
Philadelphia..	2.45c
Phila. floor....	5.10c
Pittsburgh	2.85c
Portland	2.50c
San Fran.	2.40c
Seattle	2.50c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.50c
Buffalo	3.50c
Chattanooga..	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.35c
Los Ang.	3.95c
N. Y.	3.00c
Portland	3.50c
Phila.*† (e)	2.90c
Pitts.**	3.00c to 3.10c
San Fran.	3.65c
Seattle	3.50c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.20c
Buffalo	4.10c
Chattanooga..	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.00c
San Fran.	4.15c
Seattle	4.00c
St. Louis	3.80c
St. Paul	3.545c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	4.75c
Buffalo	4.35c
Chattanooga..	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	3.75c
Detroit	4.00c
Houston	4.25c
Los. Ang.	5.10c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	4.50c
San. Fran.	4.65c
Seattle	4.50c
St. Louis	4.35c
St. Paul	4.23c
Tulsa	5.10c

BANDS

Baltimore	3.25c
Boston	3.75c
Buffalo	3.35c
Chattanooga..	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia..	2.75c
Pittsburgh	2.95c
Portland	3.50c
San Fran.	3.75c
Seattle	3.50c
St. Paul	3.75c
Tulsa	3.45c

HOOPS

Baltimore	3.25c
Boston	4.90c-5.40c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia..	3.00c
Pittsburgh	3.60c
Seattle	4.90c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.75c
Chicago	3.10c
Cincinnati	3.50c
Cleveland	3.10c
Detroit	3.40c
Los Ang. (a)	4.50c
New York	3.30c
Philadelphia*	3.30c
Pittsburgh	3.10c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)..	3.85c
St. Louis	3.35c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.25c
Chicago (soft) (b)..	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

‡Domestic bars.

*Plus quan. extras.

**Less than 25 sheets.

*†50 or more bundles.

Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.25c, Conn., for copper

Sheets	
Yellow brass (high)	12.50
Copper, hot rolled	15.37½
Lead sheets, to jobbers	6.75
Zinc sheet (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	15.75
Seamless copper	14.87½
Rods	
Yellow brass (high, full turnings)	10.25
Naval brass	11.37½
Anodes	
Copper untrimmed	12.25
Wire	
Yellow brass (high)	12.50

Old Metals

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	3.25 to 3.50
Chicago	2.50 to 2.75
Cleveland	3.00 to 3.25
St. Louis	2.75
Heavy Yellow Brass	
New York	2.00 to 2.25
Heavy Copper and Wire	
New York	4.00 to 4.25
Boston	4.50 to 4.75
Chicago	2.75 to 3.00
Cleveland	3.25 to 3.50
St. Louis	3.00
Composition Brass Borings	
New York	3.00 to 3.25
Yellow Brass Tubing	
Cleveland	1.50 to 2.00
Light Copper	
New York	3.25 to 3.50
Chicago	2.25 to 2.50
Cleveland	2.75 to 3.00
St. Louis	2.75
Light Brass	
Boston	1.65 to 1.85
Chicago	1.25 to 1.50
Cleveland	1.25 to 1.50
St. Louis	1.50
Lead	
St. Louis	2.25
Zinc	
New York	1.00
Cleveland	1.00 to 1.12½
St. Louis	1.00
Aluminum	
Clippings, new, soft, Cleve.	11.00 to 11.50
Clippings, hard, Cleveland	7.50 to 9.00
Borings, Cleveland	2.75 to 3.25
Mixed cast, Cleveland	4.00 to 4.75
Mixed cast, Boston	3.25 to 3.50
Mixed cast, St. Louis	3.50 to 4.00

Secondary Metals

Remelt, aluminum No. 12	8.50 to 9.00
Brass ingots, 85-5-5-5	6.25

Metals

Copper Prices Again Weaker Following Recent Strength—Lead and Zinc Steady

New York — Activity with regard to the copper market continued to hold chief interest in the metal trade last week. Prices were again easier after strengthening somewhat in the preceding week. Demand for all metals was dull domestically with the exception of lead which moved in fair volume. General consumption of metals in the first two months of 1932 is estimated to have been at the lowest ebb since the advent of the depression.

Copper—The metal was available from custom smelters Friday at 6.00c, delivered Connecticut, or only ⅛-cent above the all-time low of 5.75c reached a short time ago. Declining demand from abroad brought the export quotation down to 6.00c,c.i.f. European ports. World copper producers continued in conference during the greater part of the week on plans for further reduction of production and revision of rules. Nothing official was announced up to a late hour Friday but it was rumored that an agreement had been reached on further curtailment. Copper Exporters Inc. recently has been operating under marketing rules existent prior to Jan. 1 but the "official" quotation has generally been nominal.

Lead—Both midwestern and eastern sellers reported purchasing steady and in fair volume. Quotations remained unchanged on the basis of 3.05c, East St. Louis, and 3.25c, New York, for March and April shipment.

Zinc—Prices showed a steadier tone last week, remaining unchanged during the period at 2.80c, East St. Louis, and 3.15c, New York, for prime western metal.

Tin—Quotations fluctuated considerably last week, reflecting sudden strength in sterling exchange, which later was somewhat dissipated, and activity in the London market. Domestic prices remained below usual importers' costs. Buying was light.

Antimony—Dullness continued in the market with prices showing slightly more easiness late in the

Aluminum—Prices held steady but demand during the week was light.

Distillates Demand Is Light; Prices Steady

New York — Consumption of distillates, while light, is about equal to production. Toluol is slightly more active and some distributors have little available, prices being firm. Phenol has slowed up slightly with most sales at 17c. Contract shipments of naphthalene are heavier and a slight increase is noted in spot demand. Sulphate of ammonia is unchanged with prices irregular.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants in	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.10 to $1.20

Quicksilver Firm

New York—Quicksilver is firm with prevailing prices ranging from $70 to $72 a virgin flask of 76 pounds on prompt delivery. Prices on the Pacific coast are reported firm at $70 a flask. Quicksilver in Europe is reported $65 a flask, which, including $19 duty, is the equivalent of $84 a flask here. The market is quiet.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
March 5	6.12½	6.25	5.87½	22.40	23.00	3.25	3.05	2.80	22.90	6.25	35.00
March 7	6.25	6.37½	6.00	22.30	23.00	3.25	3.05	2.80	22.90	6.25	35.00
March 8	6.25	6.37½	6.00	22.05	22.85	3.25	3.05	2.80	22.90	6.25	35.00
March 9	6.00	6.37½	5.75	22.30	22.90	3.25	3.05	2.80	22.90	6.25	35.00
March 10	6.00	6.37½	5.75	21.87½	22.45	3.25	3.05	2.80	22.90	6.15	35.00
March 11	6.00	6.37½	5.75	22.00	22.55	3.25	3.05	2.80	22.90	6.15	35.00

Europe

Improvement Appears Although Tariff Fails to Stop Continent From Underselling Home Mills

London—(*By Cable*)—Slight improvement is noticeable in British iron and steel markets, although Continental makers continue to undersell British producers, in spite of the 10 per cent tariff. Demand is lifeless except that parcels of German billets and Indian pig iron continue to compete in Scotland. Galvanized sheets are unsteady and tin plate is quiet. Swansea tin platemakers hear reports that Japan plans to increase its tin plate output 50,000 tons annually. Middlesbrough pig iron exports were 5097 tons in February. The Continent reports export trade dull and prices weakening. France has started its reorganized domestic comptoirs in semifinished steel, sheets and cold-rolled steel in an effort to keep prices from falling too low.

Gas Pipe Tonnage Sought

San Francisco—(*By Air Mail*)—Sales and new inquiries were not numerous. Prices are firmer than for many weeks. Pacific Gas & Electric Co., San Francisco, is in the market for 9000 to 12,000 tons of 28-inch gas pipe for a 42-mile line between Milpitas and San Francisco. No action has been taken on 20,675 tons of rails for the Southern Pacific.

Bars, Plates and Shapes

Most reinforcing bar lettings involved small lots. Unnamed interests took 200 tons for an 8-mile cut-off for the Union Pacific Co. at Long Beach and 100 tons for a Kress store in Honolulu. Bids were opened on 600 tons for a post office at Sacramento. Out-of-stock quotations in the San Francisco district continue unchanged at 2.60c, base, on carload lots while Los Angeles district prices are weak at 1.90c. Mild steel bars are in light demand and 2.00c, c.i.f. appears to be firm.

Consolidated Steel Corp., Los Angeles, booked 400 tons of plates for a penstock for Los Angeles. Los Angeles will open bids March 9 for 325 tons for a 45-inch welded steel pipe line. Prices are firm at 1.80c, c.i.f.

Structural shape awards exceeded 1300 tons. Virginia Bridge & Iron Co. secured 850 tons for a plant at Carlsbad, N. M., for the U. S. Potash Co. Judson-Pacific Co. took 155 tons for a subway in Fresno, Calif., and 100 tons for a boiler plant at the dirigible base, Sunnyvale, Calif. Pacific Iron & Steel Co. booked 100 tons for an addition to the Willard Storage Battery Co. plant in Los Angeles. Bids have been opened on 1500 tons for a postoffice in Sacramento and on 100 tons for an armory in Salinas, Calif. Los Angeles will open bids March 15 for 500 to 1000 tons of steel sheet piling. Bids will be opened on 388 tons of steel sheet piling for work at Santa Monica, Calif., March 23. Plain standard shapes are firm at 2.00c, c.i.f., while wide flange material holds at 2.10c.

Higher Prices on Coast

Seattle—There is a firmer tone in the Pacific Northwest iron and steel markets. Increased water rates from Atlantic points have resulted in an advance in c.i.f. prices here of $2 per ton while local warehouse prices were raised 25 cents March 2.

Prevailing mill prices, c.i.f. coast, under the revised schedule, are: Shapes, wide flange, 2.10c; standard, 2.00c; bars, 2.00c, plates 1.85c to 1.90c, representing an advance of $2 per ton. Local mills are still quoting 2.30c for reinforcing material.

The largest reinforcing award of the week, 100 tons, for a state highway viaduct at Twelfth street, Bellingham, Wash., went to the Northwest Steel Rolling Mills, Seattle.

Bureau of reclamation will receive bids April 4 for furnishing concrete piers and two 45-inch steel penstocks, each 469 feet in length of 3/16 and ¼-inch steel plates for the Wippel pumping plant, Yakima irrigation project, Washington.

Structural awards this week totaled 560 tons. McClintic-Marshall Corp., St. Louis, will furnish 300 tons for the federal building annex at Butte, Mont., and unnamed eastern interests have the subcontract for 243 tons of shapes and 17 tons of concrete bars for the cantilever span, Pend Oreille river, Newport, Wash., general contract held by Colonial Bldg. Co., Spokane.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 10

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	L s d
Foundry, 2.50-3.00 Silicon	$10.68	2 18 6	$ 9.72 to $10.21	2 0 0 to 2 2 0
Basic bessemer	10.22	2 16 0*	8.75 to 9.23	1 16 0 to 1 18 0
Hematite, Phos. .03-.05	11.68	3 4 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.62	5 7 6	$11.18 to $11.42	2 6 0 to 2 7 0
Wire rods, No. 5 gage	31.13	8 10 0	24.30 to 25.52	5 0 0 to 5 5 0
FINISHED STEEL				
Standard rails	$30.11	8 5 0	$28.55	5 17 6
Merchant bars	1.14c	7 0 0	.55c	2 10 0
Structural shapes	1.26c	7 15 0	.53c to .54c	2 8 0 to 2 9 0
Plates, †¼ in. or 5 mm	1.43c	8 15 0	.65c to .66c	2 19 0 to 3 0 0
Sheets, black, 24 gage or 0.5 mm.	1.43c	8 15 0	1.32c to 1.35c	6 0 0 to 6 2 6
Sheets, gal., 24 gage, corr.	1.56c	9 10 0	1.54c	7 0 0
Bands and strips	1.56c	9 10 0	.74c to .77c	3 7 6 to 3 10 0
Plain wire, base	1.38c	8 10 0	1.18c	5 7 6
Galvanized wire, base	1.79c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.79c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.92	0 16 0	$3.20	0 13 2‡

British ferromanganese $72 to $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d	French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$10.68	2 18 6	$ 9.48	240	$10.32	370	$16.46	69
Basic bessemer pig iron	10.22	2 16 0*	.....	.....	8.93	320	18.01	75.50
Furnace coke	2.42	0 13 3	5.10	129	4.46	160	5.10	21.40
Billets	19.62	5 7 6	13.04	330	11.58	415	23.73	99.50
Standard rails	1.34c	8 5 0	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars	1.14c	7 0 0	.90c	500	.64c	490	1.24c	115
Structural shapes	1.43c	8 15 0	.99c	550	.64c	490	1.22c	112.50
Plates, †¼-in. or 5 mm.	1.47c	9 0 0	1.17c	650	.76c	585	1.43c	132
Sheets, black	1.43c	8 15 0§	1.30c	720‡	.88c	675‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	1.56c	9 10 0	2.43c	1350	.....	.....	4.00c	370
Plain wire	1.38c	8 10 0	1.75c	970	1.95c	1,500	1.92c	178
Bands and strips	1.56c	9 10 0	.96c	535	.88c	675	1.44c	133

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basis price.
British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

Machinery

WATCHFUL waiting for Ford seems to be the order of the day and it certainly is to be hoped that general belief in the ability of this one manufacturer to stimulate activity throughout the entire industrial structure will prove to be well grounded. It should not be long before this belief comes to the test. In the meantime level of activity in many equipment industries has fallen to new lows, but in spite of this, business sentiment has held up and even improved—indicating renewed faith in underlying conditions. Report of machinery exports in January tells a sad story of the recent annihilation of our foreign markets.

New York—Machine tool inquiry is light and shows few—if any— signs of improvement. The same is true of other kinds of industrial equipment, including cranes, etc. Nevertheless, March volume in most cases is holding its own as compared to that of February, which is a better condition than is being reported from some other industrial centers.

Among favorable factors may be mentioned: Some little improvement in some manufacturing schedules, including those of certain of the ball bearing plants; opening of additional bids on machine tools by the navy department; and a minor spurt in buying of small tools and machinery for repair departments, on the part of certain textile mills in the South.

Unfavorable factors include: Publication of disheartening 1931 reports by some of the larger machinery dealers and builders; failure of railroads to place orders for much needed metalworking equipment; apparent delay in getting the new Ford cars on the market; and a veritable collapse in our foreign machinery market.

Sentiment generally is optimistic and belief is expressed that recent governmetal action—the Glass-Steagall act in particular—lays the groundwork for recovery.

Worcester, Mass. — February figures compiled by some machinery builders in this district indicate that it was the worst month in many years as far as they are concerned. In the meantime, continued lack of orders and declining volume of inquiry leaves the equipment market more stagnant than ever.

The last units on a recent large order for grinders are being shipped to Ford Motor Co. New developments in that direction are counted upon to stimulate business within the near future. Actually, there is nothing else in sight.

Advantages of diversification are demonstrated by the fact that in the face of these depressed conditions in the metalworking industry, payroll and power indices for this section actually show an increase of about 10 per cent.

Pittsburgh — Status of the machine tool market practically is unchanged. Dealers are receiving occasional orders, a large portion of which involves equipment pending for some time.

Inquiries fail to indicate that users are departing from recent practice of buying only equipment which is urgently needed, and volume of new inquiry lacks improvement. Orders and inquiry both are confined usually to single tools.

Cleveland—Fair gains are reported among suppliers of automotive parts—particularly in the case of those supplying to Ford. Men also have been taken on in some of the larger of the locomotive repair shops. Aside from possible increase in orders for small tools and repair parts, however, there has been no favorable reaction in the machinery market.

Local interest is evident in recent navy lists, one in particular which opens March 15 including a turret lathe, an automatic screw machine and several other machine tools on which Cleveland builders and dealers have submitted bids.

It is worthy of comment that in several cases Cleveland machinery builders, while showing operating losses for 1931, also show substantial cash balances, which are in marked contrast to highly unfavorable cash positions held in a comparable period of the 1921 depression.

Chicago—A few scattered inquiries, even though relatively unimportant, at least have indicated more life in the machine tool market during the last few days.

Repair parts and fixtures ordered by the railroads testify to the increased activity in their shops, although inquiries for new shop tools are being withheld. Chicago, Great Western railroad will buy two 18x3-inch grinders, and a 2-inch double head bolt threader.

Industrial inquiries of individual items are mentioned, but few of these actually are promising. Purchase of a lathe and a milling machine are being given consideration.

Machine tool builders are quoting unchanged prices on new work in prospect and in cases wherein dealers are supposed to have made concessions, it is believed that these have been offered to move equipment that has been on display floors for a long period.

Depression Hits Export of Metalworking Machinery

Washington—Sales abroad of American industrial machinery during January, 1932, amounted approximately to $5,000,000, according to figures just released by department of commerce. This represents a decline of 42 per cent below the level of the previous month and 67 per cent below that of January, 1931. These figures give tangible evidence of the severity of the depression in the industrial equipment business.

In previous reports it has been noticeable that exports of power-driven metalworking machinery have been holding up far better than the general run of equipment. With the present report, however, it becomes evident that this condition no longer exists. A slump of 69 per cent below January, 1931, and 56 per cent below December, 1931, is recorded.

Power-generating equipment and construction and conveying machinery (with the exception of hoists, which actually showed a little improvement) shared with machine tools in the heavy downward trend. The only broad classification which sustained its foreign sales during the period under review, was the textile, sewing and shoe machinery group.

Navy Soon Will Open Bids On Plant Equipment

Boston—Bids close March 15 with navy bureau, division of supplies and accounts, on a heavy duty engine lathe for Boston and March 22 on governors, pumps and spare parts for Boston and for Puget Sound.

Also closing March 15 are bids covering: Back-geared screw cutting lathe for Mare Island; roller die type nibbling machine for New York; squaring and slip roll forming machines for Mare Island; and universal turret lathe for Philadelphia.

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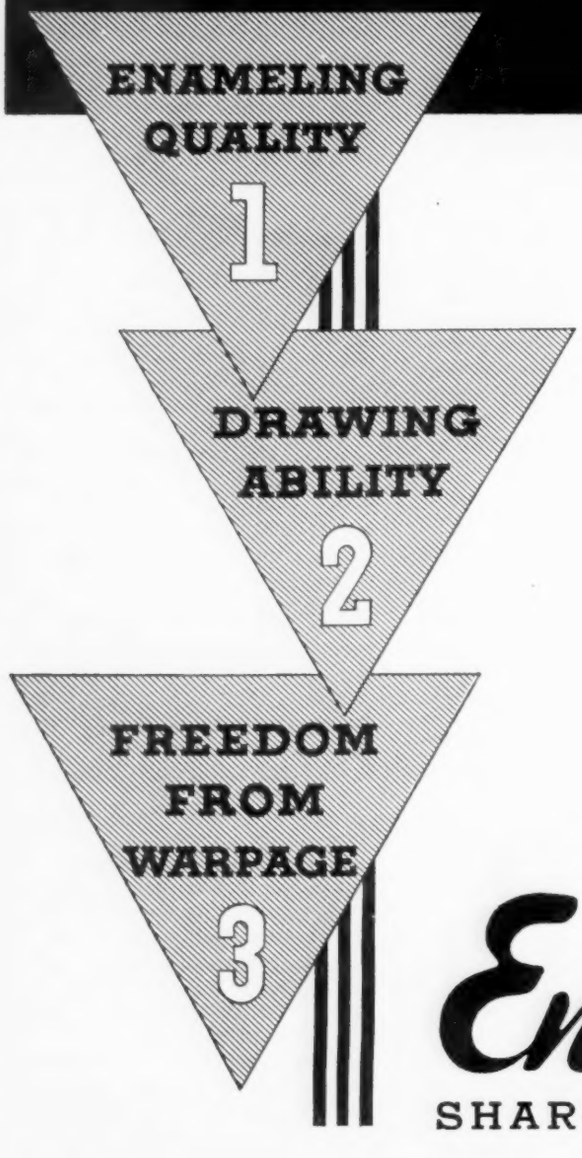

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Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

TAUNTON, MASS.—Brownell & Burk Co., Washington street, carriage and automobile body manufacturer, plans to rebuild its burned plant at Hodges avenue and Washington street, to cost $60,000.

WEYMOUTH, MASS.—Crawford Machine Co., Central avenue, will rebuild its burned plant at a cost of $50,000.

New York

NEW YORK—Pyramid Grate Corp. has been incorporated with 100 shares no par value to manufacture fuel-saving devices, by G. Boochever, 270 Broadway, New York.

ROCHESTER — Ashley Machine Works has been incorporated with $15,000 capital to conduct a machine shop, by H. H. Servic, Rochester.

ROCHESTER—Gray Metal Products has been incorporated with $10,000 preferred stock and 400 shares common stock to manufacture roofing material, by R. H. Culley, Rochester.

SYRACUSE — B. Heckerman Iron Works has been incorporated with $10,000 capital to manufacture metal products, by Sterling, Swartz & Simon, Syracuse.

New Jersey

CAMDEN—Indol Products Inc. has been incorporated with 5000 shares common stock no par value to manufacture machinery and act as builders and contractors, by A. M. Stackhouse, Broadway and Cooper streets, Camden.

EDGEWATER—Stellar Lamp Corp. has been incorporated with $2000 capital to manufacture lamps, by Warren R. Schenck, 43 Paterson street, New Brunswick, N. J.

HOBOKEN—National Forge Inc. has been incorporated with 1000 shares no par value to manufacture iron and steel products, by Isaac W. Seiler, 545 Broadway, Bayonne, N. J.

NEWARK—Carbrow Inc. has been incorporated with 500 shares common stock no par value to manufacture steel rule dies and cut work for paper and paper box industry, by Karl Z. Kiefer, 17 Academy street, Newark.

NEWARK—Ogden Machinery Corp. has been incorporated with 1000 shares common stock no par value to manufacture machinery and conduct a brass foundry and metal working plant, by Julius Stein, 24 Commerce street, Newark.

Ohio

TOLEDO—Barnsdall Oil Corp., Tulsa, Okla., George Locke vice president, plans a refinery to cost $2,000,000 on Way Shore road, Toledo, to extract alcohol from crude oil.

Michigan

DETROIT—Motor & Machinery Casting Co. will build a foundry on Davison avenue. Angell & Shreve, Detroit, are architects.

DETROIT—Ultra Steel Corp. has been incorporated with 2000 shares no par value to manufacture sheet steel stampings, by John T. Hanlon, 1045 Ferdinand avenue, Detroit.

DETROIT—Morse Tool Co. has been incorporated with $25,000 capital to manufacture tools, by David W. Harvie, 1010 Ford building, Detroit, and associates.

JACKSON — Multimatic Machinery Corp. has been incorporated with 50,000 shares no par value to manufacture machinery, by George Melling, 1302 Jackson City Bank and Trust building, and associates.

KALAMAZOO — Martinson Machine Co. plans an addition to its plant, to be built in June.

Illinois

CHICAGO—A. B. T. Mfg. Co., 331 Carroll avenue, is building a 2-story addition to its plant, 36 x 90 feet, for the manufacture of coin-operated machines, to cost $80,000.

GRANITE CITY—Granite City Casting Co., Sixteenth street and Delmar avenue, has been incorporated with $20,000 capital to operate a foundry, by R. W. Griffith, City Hall, Granite City, and associates.

JOLIET—J. F. Bitterman Steel Products Co., 1401 East Cass street, plans to build a plant on Collins street, 100 x 200 feet, to cost $75,000.

MOLINE—Bids will be asked soon, to be opened April 8, for improvements to municipal waterworks, plans for which have been made by Pearse, Greeley & Hansen, 6 North Michigan avenue, Chicago. Include filter plant of 5,000,000 gallons per day capacity and reservoir of 3,000,000 gallons capacity and additional low-lift pumps for pumping station.

ROCKFORD — Parker Bros. Sheet Metal Co., 100 Forbes street, has been incorporated with $1000 capital to do general sheet metal work, by Frank M. Ryan, attorney, Rockford.

Southern States

WASHINGTON—Bids will be received until March 22 by the bureau of supplies and accounts, navy department, for a self-propelled, gasoline-engine driven, crane with swinging boom, for delivery to Pensacola, Fla. Schedule 7569.

NEW ORLEANS—Board of levee commissioners, Orleans levee district, is taking bids until March 29 for a group of buildings, including two hangars, 125 x 225 feet, repair shop 100 x 120 feet, emergency and storage building, at Shushan airport on Lake Pontchartrain. National Airport Engineering Co. Ltd., 775 East Washington street, Los Angeles, is engineer.

Dominion of Canada

BURLINGTON, ONT.—City council is considering plans for improvements to the waterworks system, including a new pumphouse and equipment, to cost $130,000. G. H. Power, Oakville, Ont., is engineer.

ETOBICOKE, ONT.—Bids are being taken at the township office at Islington, Ont., for three vertical type raw sewage pumps for the sewage disposal plant. H. H. Walker is township engineer.

WOODSTOCK, ONT.—Public utilities commission is considering installation of an electric pump in the waterworks plant. R. L. Murray is chairman, 248 Dundas street.

New Trade Publications

BUFFALO BUSINESS HISTORY—In the January issue of its publication, *Niagara Area Journal of Commerce*, the Buffalo chamber of commerce has presented a centennial and roster number. It gives a great deal of history of the century since the founding of the city and a roster of membership of the chamber. Illustrations of scenes in the earlier city are of interest.

ROLLS — United Engineering & Foundry Co., Pittsburgh, in bulletin R-1001 presents its facilities for the manufacture of rolls for every class of rolling mill work, hot and cold, ferrous and nonferrous. Illustrations show the breadth of field covered. Various alloys for strength and wear are also described.

ELECTRICAL SHEETS — American Rolling Mill Co., Middletown, O., has issued a bulletin on electrical sheet steel grades for various uses in electrical construction. Charts are included to show magnetization curves and core losses. Another bulletin by this company covers uses of its special iron sheets in architectural construction. This is its architectural bulletin No. 7.

ELECTRICAL EQUIPMENT—Allen-Bradley Co., Milwaukee, is distributing a number of bulletins for holders of its loose-leaf catalog, bringing to date information on various products and devices. A checking list is included, showing the bulletins and price sheets the catalog should contain to be complete.

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Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

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Gantry Cranes
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Car Dumpers
Forging Manipulators
Steam Drop Forge Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

271 of 100 Tons Capacity and over

LADLE AND STANDARD CRANES

59		100 tons
2	WORM DRIVEN Ladle,	100 tons
2		115 tons
6	WORM DRIVEN Ladle,	125 tons
45		125 tons
30		150 tons
3	WORM DRIVEN Ladle,	150 tons
6	WORM DRIVEN Ladle,	160 tons
2	WORM DRIVEN Ladle,	165 tons
4	WORM DRIVEN Ladle,	175 tons
27		175 tons
3	WORM DRIVEN Ladle,	200 tons
4		200 tons
5		225 tons
1		250 tons
3	WORM DRIVEN Ladle,	250 tons
3	WORM DRIVEN Ladle,	275 tons
1		275 tons
1		300 tons
3		430 tons

STRIPPING CRANES

8		100 tons
1		125 tons
21		150 tons
19		200 tons
1	Single Ram,	320 tons

COMBINATION CHARGERS AND STRIPPERS

3		100 tons
1		125 tons
3		150 tons
4		200 tons

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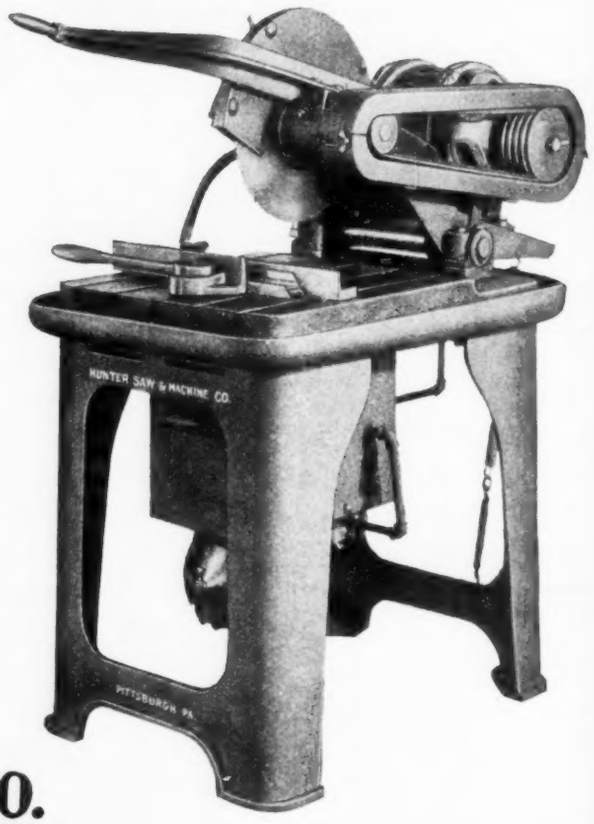

This Hunter No. 6 Metal Cut Off Saw takes a standard 18″ diameter saw or a 16″ diameter abrasive wheel; with the saw it cuts light sections, angles, pipe; with the wheel it cuts solids up to 1½″ diameter. Wheels and saws are set up alike and held by the same driving flange, the drive is identical.

The peculiar advantages of such a combination machine are obvious—we will be very glad to tell you all about it.

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